## Conflicting Logics and Hybrid Strategies in University-Business Co-operation

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An Empirical Study at Indonesian Universities

Firmansyah David

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VRIJE UNIVERSITEIT

# Conflicting Logics and Hybrid Strategies in University-Business Co-operation: An Empirical Study at Indonesian Universities

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door

Firmansyah David

geboren te Sungai Geringging, Indonesia

promotoren: prof.dr. P.A.A van den Besselaar
prof.dr. P.C van der Sijde

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**Summary**

The main goal of this dissertation is to answer "how do the different institutional logics impact the participation behavior of academics in the complex environment of University-Business Co-operation (UBC)"? Co-operation between university (knowledge institutes, in general) and the business (industries) world has become the fuel for innovation and economic growth. Nevertheless, UBC remains complex and is considered as a problematic task for universities and their business partners. When many countries design policy aimed to "exploit" science and knowledge produced by the university, it appears that many hurdles for government and university to maintain or even to "start" the UBC. The studies in this dissertation based on an in-depth investigation and analysis of UBC program, which took setting in Indonesia. As the country that has a goal to be an Innovation-Driven Economy in 2020, empowering academics (scientists) and transferring knowledge to industries is the one of the innovation policies. However, low participation and plenty of unmotivated academics who were not interested to involve in such program become the obstacles. Hence, this dissertation attempts to explain such phenomena by questioning (1) what is the impact of different institutional logic for innovation system? (2) What are the incentives and obstacles of UBC perceived by university managers and academics? (3a) How do academics cope with competing institutional logics in UBC? And (3b) What are the academics' roles and responses under the complexity of UBC? Two approaches were deployed, desk and case studies, which divided into four empirical papers.

Although the driving and inhibiting factors are taking into account, the findings suggest that that both organizational actors such as university managers and scientists share a common perception on the incentives of UBC which consisted of industrial funding; organizational and individual reputation; trust from industries and applied research. Further, organizational actors at both universities (private and public) considered bureaucracy, industrial commitment, different in vision and orientation, teaching obligation and basic research are the major obstacles for UBC. The dissertation shows that the participation behavior of academics in the complexity of UBC can be classified into several

groups of coping strategies based on their roles and responses. Group I (Traditional Academics): academics who are familiar in science logic but novice in business logic. This group of academics ignore business logic and comply to science logic. Persons in this group will act as the follower. If the persons "identified" with science logic, they will act as a "protector", who defy business logic. In Group II (Traditional Hybrids), academics who identified with science logic and familiar with business logic may act as an "integrator". The persons in this group compartmentalize the science and business logics. In Group III (Entreprenerial Hybrids), academics who have (or before academic's career) had experience with business may act as an advocator. The persons in this group are "identified" with business logic and familiar with science.

The dissertation underlines that recognizing the participation behavior of academics should be included in the starting phase of co-operation. Based on the finding of this research, university or government should "recognize" the "skills", "values" and "experience" of individual academics in business before engaging them in university-business co-operation. This research infers that inexperienced academics must "learn" in advance about the logic of business before involving themselves in collaboration with business projects. Eventually, to make UBC successful, individual academics should able to manage the different vision and orientation with the business world.

# Chapter 1: Introduction[1]

## 1.1. Background

Countries are developing and preserving an innovation ecosystem where government, universities, and business have their place (Lundvall, 1992; Etzkowitz and Klofsten, 2005). Such an innovation ecosystem would ideally result in a mutual (economical) gain when these actors can collaborate and synergize (Mars et al., 2012). It offers policy-makers a more integral understanding in the formulation, design, and retention of a National Innovation System (NIS) (OECD, 1997). Accordingly, the government agencies in the Organization for Economic Co-operation and Development (OECD) countries have played their roles as the 'stimulators of action' by promoting University-Business Co-operation (UBC) (Mowery and Sampat, 2004).

Universities are increasingly considered as part of the innovation ecosystem and as important actors in creating and preparing knowledge to be commercialized in various forms and shapes. Over the last 25 years, universities have gradually adapted to perform this 'new' role (e.g. Etzkowitz, 2002; Wissema, 2009). Nevertheless, this 'new' role is still a bit 'strange' in the university and the tasks ('third mission') connected with this role are known under a variety of names ranging from 'technology transfer', 'outreach', 'science marketing' to 'commercialization' and 'valorization'. Many authors have built models to describe this new role in the context of the university and its environment. For example, Chatterton and Goddard (2000) emphasized that the 'new task' or'third mission' should be performed in conjunction with the tradi-

[1]Parts of this chapter are authored by Van der Sijde, P., David, F., Frederik, H., & Carretero, M. R. (2014) and have been published in 'University-Business Co-operation: A Tale of Two Logics', *Moderne Konzepte des organisationalen Marketing* (pp. 145-160) Springer Fachmedien Wiesbaden. Edited by T. Kliewe, T. Kesting (Hrsg.).

tional universitytasks: research and education; moreover, it should provide added value to those tasks (Van der Sijde et al., 2002). Etzkowitz (1998) and Leydesdorff and Etzkowitz (1996) introduced the Triple Helix: university (or more generally: knowledge institutes), government and industry (business) should co-operate and develop together to enhance wealth and prosperity for all. Notwithstanding the benefits for all involved, it appears that there are many hurdles to take and governments all over the world design policies and incentives to encourage co-operation between university and business, indicating that UBC is not a 'natural' strategy for either of them.

UBC becomes a foothold for countries to 'bring' universities into the arena of innovation ecosystem (OECD, 1997). Nevertheless, universities remain organizations that carry out their (main) missions in education and research. In the innovation ecosystem, universities should extent their missions further beyond the boundaries of research and teaching (Culum et al., 2013; Sam and Van der Sijde, 2014), with a 'service' to the community. This mission, as mentioned earlier, often referred as the 'third task' showing universities shouldcontribute and share knowledge to society in order to complete the task. As approached by several researches, the third task may lead to various forms and shapes, for example, 'community service' (Preece, 2011); 'technology transfer' (O'shea et al., 2005; Laredo, 2007); 'knowledge transfer' (e.g. Gulbrandsen and Slipersaeter, 2007; Geuna and Muscio, 2009); 'academic entrepreneurship'(Rothaermel et al., 2007; Wright, 2007); 'university and business interaction' (Lawton et al., 2001; Groen andVan der Sijde, 2002); and 'university-business co-operation' (Davey et al., 2011; Ranga et al., 2013). In this dissertation, we use the term UBC to refer to thethird task in all its shapes and forms.

Academics play an important role in the process of UBC. At the individual level, an academic can act as an 'agent' and starta relationship between a university and a business that is in the two parties'mutual interest. This is rather a challenging task, since by acting as agents; academics should extend their orientation beyond teaching and research. Academics should be able to bring together features from the two different worlds into a mutually beneficial 'framework' that incor-

porates university and business interests. Also, at the organizational level, fostering a relationship between two different institutions is not an easy task; it requires effort to prepare both types of organization for co-operation. Third parties, such as government agencies or funding organizations can have their own interests in bringing universities and business together. All policies and strategies imposed on or created by an organization are considered as influencing the 'logics' of an institution.

Studies on UBC are vast and evolving, allowing scholars to approach the topic from various theoretical perspectives, methods, and contexts. The characteristics of universities and academics are considered to be an emergent topic, particularly in developed countries (Teixeira and Mota, 2012), with less interest from the developing countries' perspectives (Schiller and Liefner, 2007). Moreover, the topic of academic characteristics was corroborated by many studies emphasizing the roles and motivations of individual academics in the creation of UBC (Arvanitis et al., 2008; D'este and Perkmann, 2011; Ankrah et al., 2013). The engagement of academics can be driven by factors like opportunity, commercialization, funds, and research (Perkmann and Walsh, 2008). Such engagement remains problematic due to various causes; one of the classic issues is institutional complexity (Geisler and Rubenstein, 1989; Lee, 2000; Agrawal, 2001; Barnes et al., 2002; Etzkowitz and Klofsten, 2005; Fontana et al., 2006; Ranga et al., 2013; Perkmann et al., 2013). Few studies have paid attention to scrutinizing this issue from the institutional logic perspective, which gives a feasible approach to studying the academics' attitudes under the institutional complexities, particularly in UBC (Bjerregaard, 2009, 2010; Sauermann and Stephan, 2013; Perkmann et al., 2013). Responding to the need for close examination, this dissertation aims to obtain a better understanding of the participation and engagement behavior of individual academics under such circumstances.

## 1.2. Theoretical perspective and debates

### 1.2.1. University-business co-operation: a tale of two logics

How a university can create and maintain its co-operation with the business world is an intriguing topic. Many approaches and theories were applied to obtain a better understanding of how academics utilize the drivers and resolve the barriers (D'Este and Patel, 2007; D'Este and Perkmann, 2011); however, hardly any recent studies give further insights on how individual academics handle the institutional complexities in UBC (Perkmann et al., 2013). The studies in this dissertation aim to investigate the participation behavior of academics in UBC from the institutional logics perspective, as this lay feasible groundwork for observing the behaviors of individuals under institutional complexities (Thornton et al., 2012). Thornton and Ocasio (1999, p. 804) define institutional logics as 'the socially constructed, historical patterns of cultural symbol and material practices, including assumptions, values, and beliefs, by which individuals and organizations provide meaning to their daily activities'. An institutional logic refers to a set of assumptions and values guiding attitudes and behaviors of agents in the specific institutional environment (Dunn and Jones, 2010; Thornton et al., 2012). These definitions have provided a foundation for discussing the integration process between field level and micro level actions (Coleman, 1990; Thornton et al., 2012). These definitions also allow a discourse of an integration of the top-down with the bottom-up effects of institutional demand (Christiansen and Lounsbury, 2013). When we bring these definitions to the context of UBC, they predict that academics and business professionals in such co-operation, because of the different types of organizations, will have different values, beliefs, and rules.It has also been said that institutional complexities shape rational, mindful behavior, and individual and organizational actors have some hand in shaping and changing institutional logics (Thornton, 2004). In the world of business and industry the denizens differ from those in academia. Although both groups of denizens received their education and training in a similar world, afterwards they started 'living' in different worlds, each world with its own logic.

The two worlds of universities and business are two worlds governed by different institutional logics (Elmuti et al., 2005, Sauermann and Stephan, 2013). At the 'organization logic' level, Merton (1973) proposed that the university system is basically founded by a norm of science, such as universalism, organized skepticism, and communalism. Murray (2010) and Sauermann and Stephan (2013) support Merton's norms and divided the differences in the organizational characteristics between universities and businesses into two labels – 'academic logic' and 'commercial logic'. The academic logic is emphasized in the search of fundamental knowledge or research, independence in research activities, peer recognition, and the openness in the dissemination of research results. Further, they argue that commercial logic (business logic) is the opposite term of academic logic. For instance, in practice, businesses will expect an applied research, limited disclosure or dissemination of research results, and private allocation of financial returns of research results. In the expected products, businesses aim to have a concrete application, while academics at the universities undertake their contribution in forms of new ideas, empirical findings, new models, measurements, and new methods (Cyert and Goodman, 1997). Moreover, in research collaboration, businesses will consider the research results to be only for private ownership while universities will intend to extend their scientific knowledge through the publishing of research results.

Further, the norm of 'academic logic' is at very general which it has been widely shown that the way it works in practice depends on the characteristics of the scientific fields or disciplines (Whitley, 2000).A university consists of various intellectual disciplines where each of the disciplines has its own sphere or 'logic'. We presume this is a form of another institutional logic: the 'science logic' or field logic. We refer to the Whitley theory that describes the 'science logic' as the nature of intellectual disciplines that is diverse in dimensions of 'mutual dependences' and 'task uncertainty' (Whitley, 2000). The 'mutual dependence' refers to the degree of 'dependencies' between academics and is dependent upon knowledge produced in other fields. The 'task uncertainty' is related to the general goals, the degree of research outcomes, and research processes. These norms add to the complexity of logics in UBC

and may create conflicts that academics must deal with. To make UBC successful, academics are supposed to or be demanded to successfully cope with such institutional complexities (Perkmann et al., 2013).

### 1.2.2. Academics and the business world

Why and how the academics run their collaborations with the world of business is an interesting research question and has been approached by scholars over time (Gallart et al., 2002; Perkmann et al., 2013). No matter what the context is, the main reason for an academic to be involved is that the activity creates benefits in some forms (status, contacts, financial revenues or academic acknowledgement). Boyer (1996) argues that an academic will get benefits if he/she is able to build up a relationship with person(s) outside academia. The person or persons outside academia refers to individual and groups in the society, particularly organizations that can bring profit for academics. Such a relationship needs to be a mutually beneficial one: academics provide knowledge, and professionals 'outside academia' use the knowledge; the collaboration arising from such relationships is widely known as UBC and it can directly impact the innovation ecosystem.

Although such benefits and the mutual relationship between academics and professionals would create a bright future for the implementation of the 'third mission' of a university, there are major barriers, one of which is the difference in institutional logics. An academic, naturally, would be exposed to university logic or academic logic. This academic logic (Merton, 1973; Perkmann et al., 2013) requires individual academics to dedicate valuable time to two activities: teaching and research. For the third mission, sometimes there is not enough time or no prioritization for academics to explore and carry out this mission. The university gives (groups of) academics the 'privilege' of managing their research independently for a given period of time. Basically, academics are 'appraised' on evaluations from students (teaching) and publications (and H-indices) in peer review journals (research). Unlike the university, business has its own 'logic' or commercial logic (Merton, 1973; Perkmann et al., 2013). The business expects (high) profits in the short-

est period and it has to deal with market conditions that change frequently (Cyert and Goodman, 1997; Elmuti et al., 2005). Academics in universities are working in a sustained and more predictable situation, although science (research) can be unpredictable.

University policy can increase academics' participation in UBC and stimulate academics to engage with the world of work. The university can collect benefits in its different forms (e.g. practitioners' publications and reputation) with such activities and this also strengthens the universities' role in enhancing innovation in a certain region or cluster. However, when this policy meets practice, logics collide: academics become exposed to two different logics. On one side, academics must fulfill their basic requirements in teaching and research to meet the university demands. On the other hand, academics must understand the logic of the business world.

### 1.2.3. Coping attitudes and strategies toward institutional complexities

The blending of multiple logics is problematic for individuals within many organizations (Seo and Creed, 2002; Battilana, 2006; Binder, 2007; Battilana and Dorado, 2010; Greenwood et al., 2011; MacPherson and Sauder, 2013; Pache and Santos, 2013; Kodeih and Greenwood, 2014; Blomgren and Waks, 2015). The scholars' understanding on the relationship between individuals and institutions remains limited (Thornton et al., 2012) and calls for further research on this topic, especially due to the growth of UBC (Owen-Smith, 2003; Bjerregaard, 2010; Murray, 2010, Sauermann and Stephan, 2013; Lind et al., 2013; Perkmann et al., 2013; Arvanitis et al, 2008). In UBC, academics will face complexities in logics where they are expected to not only be able to shift their academic (science) logic to business logic, but also to blend both logics (Murray, 2010); or to transform their dominant logic (science logic) into business logic (Jain et al., 2009). Christiansen and Lounsbury (2013) labeled these circumstances with the expression of 'logics in action', which indicates the dynamic interaction and mixing of two or more in-

stitutional demands. Moreover, examination of individual roles and different identities in response to institutional complexities is still open for further studies (Lok, 2010).

Pache and Santos (2013) emphasized that although institutional scholars declare that institutional logics provoke similar actions at the field level, scholars recognize that several fields are exposed to competing logics, which was also proposed by Friedland and Alford (1991). The competing logics may cause competing demands in organizations, and their members may use a set of logic that may diverge from regular obedience (Pache and Santos, 2010; Murray, 2010; Greenwood et al., 2011; McPherson and Sauder, 2013). Swan et al., (2010), for example, states that the colliding logics between the university's policy and its practice will lead to two distinct situations: '(1) tensions can exist within, as well as across constituent communities, in an organizational field and; (2) mobilizing a new institutional logic related to knowledge production may produce its own contradictions that can, paradoxically, lead to simultaneous resurrection (and reinforcement) of the old logic' (Swan et al., 2010, p. 1311).

To illustrate how an individual behaves under competing institutional logics, we adapted an approach from Pache and Santos (2013), as it presents a concept of coping strategies at the individual level. The approach proposes that, depending on the level of availability, accessibility, and activation of a given logic, an individual may relate to logics with three different behaviors. In increasing order of adherence, individuals may be a 'novice', 'familiar', or 'identified' with a given logic. An individual who is a 'novice' to a given logic has no (or very little) knowledge or information available about the logic. This condition occurs when an individual has not been exposed to the logic and its related demands, nor has intermingled with others exposed to them. An individual who is 'familiar' with a given logic holds available knowledge about it. Such knowledge is made available via direct or indirect/mediated social interactions. An individual who is 'identified' with a given logic is one for whom the logic is favorably accessible. The logic of an individual can define what they do, who they are, and how they 'communicate' with their society (Pache and Santos, 2013).

Further, Pache and Santos (2013) assembled a comprehensive model that predicts responses of individuals in an organization when they are faced with two competing logics. Such responses are individual-level strategies that are eventually collected as the organizational-level responses. Thus, in this dissertation we provide empirical evidence of how logic is deployed in the context of UBC. When we bring the propositions into the context of UBC, the coping strategies may encompass one of the following situations. If an academic is a 'novice' with business logic but is familiar with science logic, the academics may ignore the business logic but comply with the science logic; thus, his/her role is likely to be a 'follower' in UBC. An academic who is 'identified' in science logic is likely to act as a 'protector', showing that the academic may not with businesses. If an academic is familiar with both logics, suggesting that the logics are comparable, he or she is likely to compartmentalize the logics, and act as an 'intermediary' or a 'bridge' between the two logics (Bjerregaard, 2010; van der Sijde et al., 2014). An academic who is 'familiar' with business logic and 'identified' with science logic is likely to act a role as 'integrator'. If an academic is 'identified' with business logic and is 'familiar' with science logic, the academic role is likely to be an 'advocator'. Finally, when an academic is 'identified' with both logics, she/he is likely to act as a 'hybridizer', showing she/he can combine or blend of both logics, as also proposed by Murray (2010). We presume that these predictions may fit to describe the coping strategies of academics in UBC. Indeed, the call for empirical studies on these predictions was proposed by Pache and Santos (2013).

In terms of the hybrid behaviors of the academics, Tuunainen (2005) argued that hybrid practices show the ways that academics are able to bridge the gap between basic and applied research, as well as 'fuse' their science logic into commercial development. From an entrepreneurial perspective, Lam (2010, 2011) suggests academics can be a hybrid entrepreneur, where they can combine or blend the values of science and business when they engage in research commercialization. Moreover, Jain et al. (2009) proposed that the hybrid identity results from the ability of academics to bridge the two worlds by 'delegating' and 'buffering' the science logic into business logic. These authors pro-

posed that by acting as hybrid academics, an academic should be able to 'translate' the science to business logic, showing an effort to transfer the technology successfully. Another approach was proposed by Murray (2010) who argued that academics are kept in their (dominant) boundary (i.e. the science boundary), and can create a hybrid by 'compartmentalizing' the logics of science and business, even though the boundaries are sometimes blurred. Given this point, we highlight that scholars continue to debate the term of hybrid academics and the coping strategies they use to navigate the complexities of UBC.

The studies noted above suggest that drawing a complete picture on coping behaviors toward institutional complexities is an important step to make UBC successful. Thus, the studies in this dissertation used formal and informal participation (Perkmann et al., 2013) of academics as a probe to get a snapshot of academics' coping strategies and to understand what logics play prominent roles. Furthermore, the studies in this dissertation also take into account the driving and inhibiting factors (Etzkowitz et al., 2000; Bruneel et al., 2010; D'Este and Patel, 2007; Arvanitis et al., 2008; D'Este and Perkmann, 2011; Link et al. 2007; Ponomariov and Boardman, 2008; Grimpe and Fier, 2010; Franco and Haase, 2015) and their impact to the participation behavior and the involved logics. Figure 1 illustrates the conceptual framework and the chapters included in this dissertation.

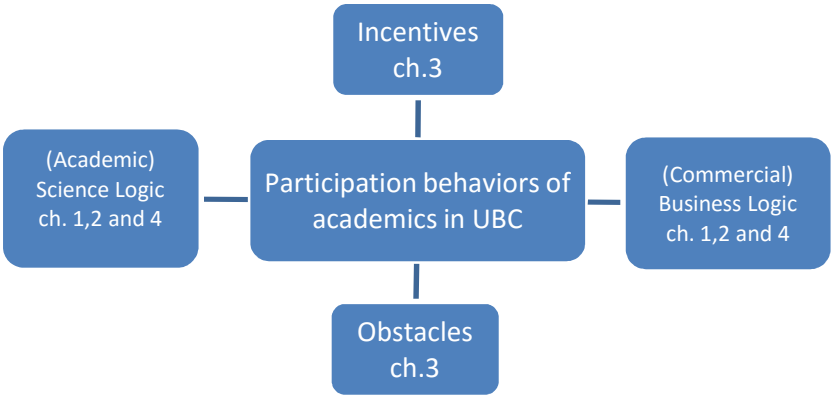

Figure 1: Multiple institutional logics and factors involved in UBC

### 1.3. Research setting and methodology

The context of this study is Indonesia. The World Economic Forum released that Indonesia's position has dropped four points to the 50th (2012) from 46th (2011) and has ascended to 41st in 2016, but it keeps the country as an efficient-driven economy (Schwab and Sala-I-Martin, 2012, 2016). Thus, Indonesia has an ambition to improve its innovative performance and aims to become an innovation-driven country by 2020 (KIN, 2012). One of the focal points of the economic policy of Indonesia is to incorporate and to involve its universities into this endeavor by stimulating the co-operation between universities and the business world. In respond to this ambition, Indonesian government has developed strategies to make universities as the center of innovation. The structured UBC programs in Indonesia have been introduced for over two decades, so-called Pengabdian Masyarakat or Community Service. Supported either by the government or university funding, academics involved in UBC in the form of activities such as performing short courses, one-day seminars, and group discussions on new methods or technologies with the person(s) and or group of business professionals. The Institute of Research and Community Service (IRCS) or Lembaga Penelitian Pengabdian Masyarakat (LPPM) handles all the UBC programs done by the academics at universities in Indonesia.

#### 1.3.1. Conflicting[2] logics: Indonesian universities dealing with business co-operation

Universities worldwide have recognized the third mission for decades (Etzkowitz, 1998). In the Indonesia context, this mission is described in the Law on Higher Education which has been institutionalized as

[2]We use the term 'conflicting' and 'competing' interchangeable.

'community service' and it is commonly organized via a central office (LPPM). The LPPM has been 'institutionalized' at the universities as the central office to manage knowledge transfer activities (similar to Technology Transfer Office) (DRCS, 2012; Van der Heide et al., 2008), such as mobilize people (academics, students, and business professionals) and serve the university and business interests. To do its task, the LPPM has to set coordination with many stakeholders such as government agencies, businesses, non-government organization, other LPPM or universities, and other related organizations. Academics consider LPPM as 'one-stop shop' to involve in UBC; either the funding comes from the university itself or from the external sources that is provided by stakeholders' grants. To assist the LPPM objectives, the government has developed and offered various funding schemes over the years, and extended the budget substantially in 2010. During the period 1992-2008, these funding schemes had just attracted a few universities and it was dominated by public universities.

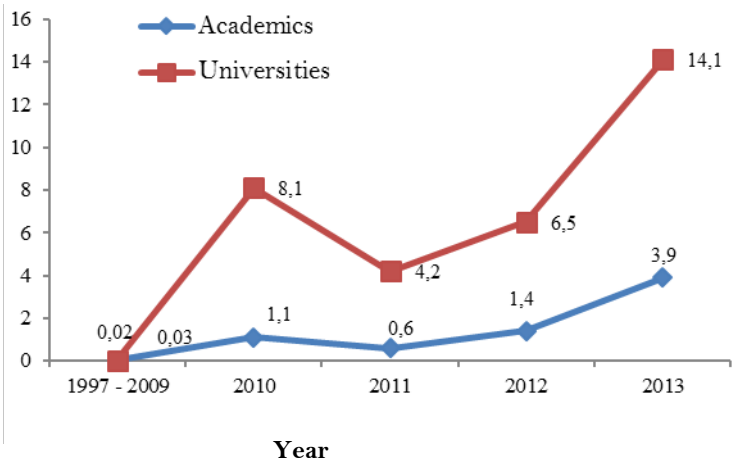


Figure 2: The percentage of universities and academics who engaged in the UBC programs (government funded). Source: DGHE documents of Community Service Program.

A big leap happened in 2010 because of cutting down bureaucracy and changing policies (see Figure 2; DGHE, 1997 - 2013). However, this percentage still does not reach the goals of academic involvement set by the Indonesian government: by 2020 at least 30% of academic staff should be involved in the UBC programs (DRCS, 2012). For comparison: Davey et al., (2011) found in their European sample an involvement of about 30%. Davey et al., (2011) also state that funding and bureaucracy are the drivers and barriers of UBC, but are not the only factors that reducing or increasing the number of UBC programs.

We propose that institutional logics might throw some light on this situation. We argue that the Indonesian community service programs show that academic logic is persistent and even in situations where the co-operation with the business world is to be complied and stimulated with subsidies (compliance), it still has not reached the level the government has set. In the academic logic, academics in an Indonesian university have to fulfill three tasks during his/her 'academic career': teaching and research are the two major tasks, for which 'career credits' can be earned. They will get at least 75% of credits from doing these activities while the other 25% can be earned via other obligations, such as Community Service[3] (DGHE, 2013). This 'career credit' system should motivate academics to engage in UBC, but the government numbers tell a different story. In general, studies show that academics have different cultures, targets, and time orientation compared to their counterparts in government and the business society (Etzkowitz et al., 2000; Cyert and Goodman, 1997). Amalia et al., (2011) argued that differences in 'language' cause difficulties in implementing research results from Indonesian universities to business. Moreover, they added that government, university and business have different 'languages' in how they 'communicate' with each other. Government has its 'bureaucratic language' which is difficult to comprehend by universities and businesses in the UBC programs. Since 2012, the government has gradually cut down its bureaucracy and now 'trusts' universities to manage

[3]It is an obligatory task if an academic willing to obtain 'academic credits' (not specified in a particular period).

the government funding. Indeed, this will bring advantages, e.g. it saves time and reduces the number of 'bureaucratic errors'. Bringing universities into the innovation ecosystem, as a governmental objective, would mean a merging of logics.

In the Indonesian context, Moeliodiharjo et al., (2012) argue that the lack of mutual understanding and trust between academics and professionals are the main obstacles to develop UBC. Based on their study, they argue that university and business in Indonesia are in a state of 'institutional sphere' instead of 'consensus space'. The authors argue that the business profesionals consider academics are too ideal and expertise in the scientific sphere but cannot merely contribute in useful help and fast solution, while academics consider professionals as a money-oriented people, practical-minded, and lack of idealism. Differences in 'language' has become an obstacle to the utilization of research in practice. Amalia et al., (2011) add that differences in 'language' between academics and professionals are the main barrier in research collaboration in many Indonesian universities. They also assert that government has its 'bureaucratic languages' whichis difficult to understand by university and business in various research collaborations.In general, universities and business have different cultures, goals, and time orientation (Cyert and Goodman, 1997) that resulting in difficulties to create and preserve the strategic alliances between them (Elmuti et al., 2005). The authors suggest that differences in cultures and objectives, external reasons, break down in trust, changes of strategy; are the main reasons that underlying why many co-operations between university and business failed to achieve their (common) goals.

Thus, Indonesian universities can be referred as one of empirical sites to study competing logics in the co-operation of university and business. When participating in UBC programs or in the third task, academics at Indonesian universities have been shaped in the 'logic action' e.g., in adherence to the institutional pressures versus an individual's interest and motivation. Bringing university to the innovation ecosystem would mean to incorporate multiple logics (Etzkowitz et al., 2000). Hence, the different logics between (academics at the) universities and the other actor (professionals in business) are the main issues. In the

case of Indonesia, academics employed by universities (university logic level of 'identified') have to cope with the demands put on them by the government. To be promoted to a higher status function in the university, an academic has to collect 'career' credits. One way of collecting them is via projects with businesses. Different ways of coping with the business logics may occur: from workshops and training programs for business, to joint projects. Analysis from government statistics shows that only a small percentage of academics were involved in this type activity. This could mean that presently majority of academics prefer not to be involved with business in order to avoid a conflict between their academic logic and the logic of the business world. The ones who get involved can do so to different degrees: from being a 'novice' as regards the business logic (and involvement via workshops, seminars, and training) to 'identified' (involvement via joint projects with joint objectives). Hence, studies deployed at Indonesian universities may provide a better understanding on individual coping strategies toward logic complexities. Grounded by this situation, this study aims to answer the central question, as follows:

> How do the different institutional logics impact the participation behavior of academics in the complex environment of UBC?

Sub questions:

1) What is the impact of different institutional logics on the participation rate of academics in UBC designed in the innovation ecosystem?
2) What are the incentives and obstacles of UBC perceived by university managers and academics?
3) How do academics cope with competing institutional logics in UBC? And what are the academics' roles and responses under the complexity of UBC?

### 1.4. Research approaches, chapters and outputs

Two different approaches were deployed in this research including: desk (document) study and case studies. Each of the approaches is proposed to answer the sub questions that are discussed in one or two

chapters in this dissertation (see Table 1). The approaches and chapters constructed are presented, as follows:

### 1.4.1. Approach 1: desk study and document analysis

This approach resulted in two chapters in the dissertation - Chapter 1: '*Introduction*' and Chapter 2: '*University-business co-operation in Indonesian higher education for innovation*'. The studies in the chapters were based on secondary data obtained by collecting UBC documents. The documents were collected through various sources, including government homepages, university websites, and newspapers. These sources provided information regarding UBC programs, such as expected goals, mechanisms, and the number of participants (academics or universities). The collection of documents was determined in the period of the last two decades of the structured UBC programs, starting from 1992 until the present day. From the government homepages, documents that related to UBC frameworks, policies, funding-schemes, and granted universities were examined. Approximately 200 documents were collected and examined, including the LPPM's strategies and policies, such as information of the internal funding schemes, programs, failures, and success stories. Other information was deduced from online sources, such as articles and papers, using certain keywords that included university-industry relation, Indonesia, community service, university-industry collaboration, and university-industry interaction.

### 1.4.2. Approach 2: case studies and interviews

This approach is discussed in two chapters - Chapter 3: '*Entrepreneurial incentives, obstacles, and management in university-business co-operation: the case of Indonesia*' and *Chapter 4 'Academics coping with business logic: a study at Indonesian universities*'. A qualitative method is the approach used in the second study. This was used to identify the subject of the study. Rather than dealing with the entire universities, the study was conducted in several universities in West Sumatra, Indonesia. West Sumatra was chosen because it is an area or a cluster where universities and business are close to one another. It is also an area that can

represent the Indonesian universities in general. As Yin argued, a case study strategy is 'ideal for exploring phenomena in the social context from which they are inseparable' (Yin, 1994, p. 3) and provides 'adaptability in case selection' (Yin 1994: 57). We conducted case studies at two universities, a public and a private, from February – March 2014. Within this approach, 26 interviews were conducted and we thoroughly examined the university's and LPPM's documents. The interviews were transcribed verbatim and resulted in approximately 250 pages of transcripts. ATLAS TI-7 was used as a tool to code and analyze the data. This approach examined how the UBC programs were established, and whether UBC was created with or without government funding. The interviews were addressed to the university managers, personnel in the LPPM, and individual academics. We explored the topic of valorization of research, drivers and barriers, and coping mechanisms.

Table 1: Research approaches, chapters and outputs

| **Research Sub-questions/Chapters** | **Periods** | **Activities** | **Research Outputs** |
|---|---|---|---|
| Introduction | Dec. 2012 – Sept. 2013 | Collection and Analysis of Documents and Articles<br><br>(Desk Study) | Parts of the chapter have been published in Van der Sijde, P., David, F., Frederik, H., & Carretero, M. R. (2014). University-Business Cooperation: A Tale of Two Logics. In *Moderne Konzepte des organisationalen Marketing* (pp. 145-160). Springer Fachmedien Wiesbaden. doi: 10.1007/978-3-658-04680-4_9 |
| What is the impact of different institutional logics on the participation rate of academics in UBC designed in the innovation ecosystem?<br><br>(Chapter 2) | Dec. 2012 – Sept. 2013 | Collection and Analysis of Documents and Articles<br><br>(Desk Study) | The chapter has been published in David F, van der Sijde, P (2015). University–Business Co-operation in Indonesian Higher Education for Innovation, in Aard Groen, Gary Cook, Peter Van der Sijde (ed.) *New Technology-Based Firms in the New Millennium (New Technology-Based Firms in the New Millennium, Volume 11)* Emerald Group Publishing Limited, pp.187 – 200. Doi: 10.1108/S1876-022820150000011017. The early version of this chapter has been presented in *High Technology Small Firms* (HTSF) Conference, Manchester, UK 2013. |
| What are the incentives and obstacles of UBC perceived by university managers and | Oct.2013 – Dec. 2014 | Interview with 21 academics and 5 university managers: | The chapter has been published in David, F., van der Sijde, P., & van den Besselaar, P. (2016). Entrepreneurial Incentives, Obstacles, and Management in University-Business |

| **Research Sub-questions/Chapters** | **Periods** | **Activities** | **Research Outputs** |
|---|---|---|---|
| academics?<br><br>(Chapter 3) | | Interpretative Quotes<br><br>(Interview) | Co-Operation: The Case of Indonesia. In J. Saiz-Álvarez (Ed.), *Handbook of Research on Social Entrepreneurship and Solidarity Economics* (pp. 499-518). Hershey, PA: Business Science Reference. doi:10.4018/978-1-5225-0097-1.ch024. The earlier version of this chapter has been presented in *University-Business Collaboration and Dynamics Conference*, Amsterdam, Netherlands. 2015 |
| How do academics cope with competing institutional logics in UBC? And what are the academics' roles and responses under the complexity of UBC?<br><br>(Chapter 4) | Oct.2013 – Dec. 2014 | Interview with 22 academics: Interpretative Quotes<br><br>(Interview) | The chapter has been authored by Firmansyah David, Peter van der Sijde; Peter van den Besselaar has been revised and resubmitted to the Journal of Engineering and Technology Management (JET-M). Elsevier. The earlier version of this chapter has been presented in *High Technology Small Firms* (HTSF) Conference Groningen, Netherlands. 2015 |

# Chapter 2

## University-Business Co-operation in Indonesia Higher Education for Innovation[4]

**Abstract**

This chapter explores emerging concerns and issues of UBC at Indonesian universities. Over decades, the Indonesian government has been implemented policies and strategies to stimulate collaboration between universities and business by offering them a variety of funding schemes. It has been aimed to foster innovation and to reach the government ambition, to make Indonesia as a country in the innovation-driven economy by 2020. Our study was based on a desk evaluation and the secondary data. We collected and examined documents of the governmental policies, universities' strategies, relevant UBC articles, etc. in order to get an overview of university-business co-operation in Indonesia. Our findings suggest that the participation rate of universities and academics in UBC, especially with those funded by the government, remains low. The government expected more participation by offering more funds; however, it was not successfully achieved. We conclude that to increase the participation of universities and academics in UBC, they need to resolve the different institutional logics with their business counterparts.

[4] The chapter has been published in David, F., & van der Sijde, P. (2015). University–Business Co-operation in Indonesian Higher Education for Innovation. In New Technology-Based Firms in the New Millennium (pp. 187-200). Emerald Group Publishing Limited. Edited by A. Groen, G. Cook and P. van der Sijde.

## 2.1. Introduction

Universities worldwide are now moving more and more to the center of the innovation ecosystem (Etzkowitz and Klofsten, 2005; Lundvall, 1992). Aligned with this repertoire, policy-makers have been stimulating universities to co-operate with business in an effort to develop a knowledge-based economy (Mowery and Sampat, 2004). Universities have been encouraged to get involved with business in the form of generation, use, application, and exploitation of knowledge and to contribute their capabilities beyond the academic environment (Culum et al., 2013). The interaction and co-operation between university and business can determine the pace of innovation, especially when the most important actor promotes it, namely, the government which has a coordination, regulation and funding function (Callon, 1998; Etzkowitz and Leydesdorff, 2000). The innovation ecosystem would ideally result in common (economic) advantages when the actors of innovation such as industries, universities and government can work together (Mars et al., 2012). Many countries are shaping their innovation ecosystem in the form of the NIS by placing firms and private institutions as the main actors to foster innovation (Freeman, 1987; Lundvall, 1992; Metcalfe, 1995; Nelson, 1993). Further, the Organization for Economic Co-operation and Development (OECD) highlights that universities are the important players in improving a country's innovation performance (OECD, 1997). The policy-makers, universities and business may be settled in the innovation ecosystems when these actors can incorporate their roles and are able to work together (Lundvall, 1992; Etzkowitz and Leydesdorff, 2000). In an ideal situation, the government provides funding, universities play a role as the source of knowledge and do technology transfer, and business gets benefits from the collaboration.

A university is an organization that traditionally carries out its mission in research and teaching. In the innovation-ecosystem, universities should expand their mission beyond the boundaries of research and teaching (Culum et al., 2013; Sam and van der Sijde, 2014). The 'third mission' of a university is considerably as a 'tool' to enhance the contribution of universities in regional development (Chatterton and Goddard, 2000). Etzkowitz and Leydesdorff (2000) argue that the 'third mis-

sion' of universities may be varied depending on the universities' goals and visions. In this chapter, we assume the university-business co-operation as the shape of the 'third mission' as other studies used the terms 'technology transfer', 'knowledge transfer', 'community service', 'university and business interaction' (Groen and van der Sijde, 2002), and Rothaermel et al., (2007) coined it as the 'academic entrepreneurship' to describe UBC. Further, Davey et al., (2011) formulated UBC as the mechanism of collaboration between university and business in: Research and Development (R&D); personnel mobility (academics, students and business professionals); commercialization of R&D results; curriculum development and delivery; long-life learning; and governance.

The 'third mission' is rather a new task for some universities, while others might have performed the 'mission' for decades. Marshall (1920), in his book the Principle of Economics, introduced a theory of 'knowledge spillovers' between academics and society in a region. The theory suggests that there is an exchange of knowledge among individuals between organizations or more as well as from one employee to another. Etzkowitz and Klofsten (2005) argued that universities can manage the 'knowledge spillovers' via a strategic collaboration. The idea of a strategic collaboration among universities, government and business was also proposed by Bush (1945) in his book Science: *The Endless Frontier* by arguing that government should be in place to respond to the emerging sciences and technologies after the World War II. However, universities have to find their 'place' in the Triple Helix constellation. Etzkowitz and Leydesdorff (1995) argue the Triple Helix partnership has remained as a framework to run the NIS in the late 20$^{th}$ century.

Nonetheless, the UBC is still a problematic issue (Barnes et al., 2002; Etzkowitz and Klofsten, 2005; Geisler and Rubenstein, 1989; Lind et al., 2013). Etzkowitz et al., (2000) argue that many universities and business and the government in the Triple Helix relationship are kept operating within its 'institutional sphere'. The sphere states that the different beliefs, values, norms and practices between universities and business may cause problems and be rooted in differences of cultures,

objectives and strategy (Cyert and Goodman, 1997). These differences have led to difficulties in creating and preserving a strategic alliance between universities and business (Elmuti et al., 2005). In this chapter, we discuss how the government stimulates universities to have collaborations with business which have not been successful. Further, we illustrate that in the innovation-ecosystem, universities and academics are being exposed with different 'institutional logics' with their business counterparts, which might hinder the relationship between them.

## 2.2. The context of the Indonesian innovation performance and universities

An NIS can be used as a framework for countries to enhance their economic growth and to survive in the global competition. It is emphasized that the "flows of technology and information among people, enterprises and institutions are key to the innovative process" (OECD, 1997, p. 7) by which it also offers an integral framework for policy-makers to identify points which can foster innovation and to improve a country's competitiveness. Via the NIS, the policy-makers are supposed able to 'see' and to overcome 'mismatch' among the actors and to resolve it. The government of Indonesia adopted this framework in an effort to improve the Indonesian innovation performances by having ambition to be a country in the innovation-driven economy by 2020 (KIN, 2012). The stage where Indonesia should compete with new and/or unique products, services, models, and processes and make sure the companies can produce new and different goods through new technologies and sophisticated production processes (Schwab and Sala-i-Martin, 2012). Presently, Indonesia still remains as the country in the stage of the Efficiency-Driven Economy according to the Global Competitiveness Index (GCI) published by the World Economic Forum (WEF). The index put Indonesia in the 50$^{th}$ position of the most competitive country out of 144 nationalities in 2012 (see Table 2). This stage shows that Indonesia has been successful in competing based on efficient production processes and increased product quality (Schwab and Sala-i-Martin, 2012).

Experiences from countries that have managed to be in the innovation-driven economy are examples for the Indonesian government to refer to or to learn from. In the Asian context, Singapore and Republic of Korea are two countries that successfully managed to become innovation-driven economies (see Table 2). By spending at least 3% of its GDP on Research and Development, Singapore has succeeded in 'bringing' its universities into the arena of the innovation ecosystem (KIN, 2012). The BIOPOLIS, an example of an innovation cluster, has been managed by the National University of Singapore, Singapore Polytechnics, National University Hospital and Business School which mainly focused in the Research and Development of Biosciences (Biopolis, 2013). Republic of Korea spent over 3% of its GDP in 2011 and 5% in 2012 (KIN, 2012) and its government also succeeded in 'stimulating' 232 universities, 40 corporate research centers and 20 research institutes that formed an innovation cluster (Daedeok, 2009).

Table 2: the Indonesia competitiveness position based on the global competitiveness report of the World Economic Forum.

| **Country** | **Stage of Developments** | **Overall Rank** | **Higher Education and Training** | **Innovation** |
|---|---|---|---|---|
| Singapore | Innovation-driven | 2 | 2 | **8** |
| Korea (Rep.) | Innovation-driven | 19 | 17 | **16** |
| China | Efficiency-driven | 29 | 62 | **33** |
| Indonesia | Efficiency-driven | 50 | 73 | **39** |
| India | Factor-driven | 59 | 86 | 41 |

*Source: Schwab and Sala-i-Martin (2012)*

The government of Indonesia has set a plan to increase the R&D budget from 0.07% in 2007 up to 1% of the country's GDP in 2014 (KIN, 2012). Increasing the R&D budget may be a promising step towards improving product and research capacities; however, it does not necessarily serve as the way to foster innovation. OECD Reviews of Innovation Policy underline that UBC has a strong foothold in the assessments of the

NIS (see OECD, 2006, 2007, 2008, 2009, 2013). The innovation ecosystem is demanding a well-established co-operation between universities and business as well as stimulation for universities to narrow the gap with companies and firms. Thus, the innovation-ecosystem not only requires governmental stimulation but also demands some initiative from universities. It implies in the NIS that a (entrepreneurial) university is not just interested in interaction with its social and economic environment but also in adapting itself to the changes (Clark, 2004; Etzkowitz, 2004; O'Shea et al., 2007).

We highlight the contradictory achievements of Indonesia between the ranking of the Higher Education and Innovation. The Higher education is ranked in 73rd position, which lags far behind Indonesia's performance in innovation, which is ranked 39th. This indicates that universities in Indonesia are still in the developing phases even though they have been guided by the government for decades in terms of educational structure, curriculum, lecturers' regulation, laws, etc. (DGHE, 2003). Universities are diverse in forms of public and private institutions, types of universities and size. Innovation performance shows that Indonesia has a sufficient number of resources to foster innovation such as skills, know-how and working condition (Schwab and Sala-i-Martin, 2012).

However, the role of universities to enhance innovation is actually not a new paradigm. In 1975, the Directorate General of Higher Education (DGHE) regulated the strategies and operationalization of universities by enacting the Higher Education Long-Term Strategies (HELTS). This strategic framework emphasizes the universities' contribution to societal and economic development (DGHE, 2003). In the last 10 years, the DGHE has offered grants to universities in forms of research on 'applied-knowledge clinic' and 'business incubator', to support universities on preparing their contribution to business within an innovation ecosystem. And these grants also aimed in promoting academics and professionals to have a place to meet, negotiate and deal. To conduct this, each university in Indonesia has the office of Research and Community Service or LPPM to manage all funds and activities related to research and community service. LPPM is the central office at univer-

sities to manage the knowledge and technology transfer similar to a Technology Transfer Office or TTO (van der Heide et al., 2008). In general, academics consider LPPM as a 'one stop shop' when they want to be involved in UBC, whether the funding comes from their own university or from external sources. The most important role of LPPM is to bridge the interests of academics and business professionals to work together.

### 2.3. Evaluations of the UBC programs in Indonesia

The main attention on the government policy is to improve the interaction between university and business. The government stimulates universities to have relationship with business by using the 'third mission' schema or by the university's Community Service program (DGHE, 2003). A variety of funding schemes has been offered over times through the Community Service program existing in order to narrow the distance between academics and professionals and to reach the government goal, to 'bring' university into the arena of the innovation ecosystem. The UBC done through the Community Service activities will open opportunities to transfer technology resulted from a collaboration in R&D and be used for the development or commercialization of technologies (Elmuti et al., 2005). Every university obliges its academics to be involved in a Community Service program at least one time in a semester (DGHE, 2003) both as a voluntary involvement and or by funding-based schema. After conducting this, academics will get 'credits' that will be accumulated as the 'career credits' together with research and teaching (DGHE, 2013). Academics will use these 'credits' as the preference to determine their academic career/track at the university. To evaluate the UBC programs of universities over decades, we collected documents of Community Service and Research Collaboration through the websites of DGHE, evaluation from Community Service reviews; and other sources and we grouped the numbers of universities and business into three distinct periods.

### 2.3.1. In the period before 2009

The very first structured UBC programs that funded by the government was called Penerapan Ilmu Pengetahuan dan Teknologi or the Implementation of Science and Technology (IST). It was a common form of UBC program to all universities using the Community Service schema implemented before 1992. Universities formulated the programs in forms of knowledge dissemination, training, counseling, and seminars and discussed the latest technologies or manufacturing methods with individuals, groups or entrepreneurs. Nevertheless, the programs did not entirely succeed due to its limitations based on individual initiative and action. The program did not have a significant impact to the society due to its short duration and a small amount of funds (Soewandhi, 2012). In 1994, the government introduced the Vucer as a new UBC program to replace the IST. The program required academics to be in a group, instead of individual basis, when they apply the government grant and do the Community Service activities. The program has a goal to foster collaboration between academics and Micro, Small, and Medium Enterprises (MSME) and large group business such as farmers, fishermen and entrepreneurs. The Vucer had been a successful UBC program when compared to the IST during the period until a massive economic crisis hit Indonesia in 1997. After the economic crisis, in 1999, the government continued the Vucer for several years and formed the multi-years Vucer on a three-year basis. The DGHE only considered grants for those academics who have research proposals in the research of the production of export products. After some years, the program was confronted by a variety of problems. Purwadaria (cited in Susilo, 2010) argued that 53% the problems are in the lack of commitment and trust between academics and business professionals; 27% was a result of unmatched technologies; 10% due to from the business internal problems and another 10% from products which did not fit with market demand. Kurniadi (2009) evaluates that the multi-year Vucer is limited to several university types and regions. Table 3 describes the distribution

of universities and academics in the UBC multi-year Vucer programs in the period of 1997-2008.

UBC funding is on a competitive basis. We highlight that only, at least, 2% of the total number of universities were involved in this UBC program. Furthermore, the total number of academics was only 0.5% of the total academics' population in Indonesia. The public universities are rather in the domination to 'win' the grants than the private ones, at 89% versus 11%. The disparities in research capacities, infrastructures and the qualification of academics are considered as the root of the differences. Although the multi-year Vucer UBC program was not fully considered as the successful UBC, at least, there was a positive impact. Around 62% of SMEs had developed their business performances and more than a half of business partners were successfully developed.

Table 3: Evaluation of multi-year Vucer UBC program in 1997-2008

| **Categories** | **Granted Proposals** | **Universities/ Academics** | **MSMEs** |
|---|---|---|---|
| Number of Proposals | 67 | | |
| Number of Academics | | ± 300 persons | |
| Number of Universities | | 50 | |
| Type of Universities | | 89 % Public, 11 % Private | |
| Region of Universities | | Jawa Region 63%, Outside Jawa 37 % | |
| Types of MSMEs Partners | | | Crafting 40 %, Food and Agro-Business 48 %, Metal & Electronics 12 % |
| MSMEs condition during the program | | | Develop 62 %<br>Undeveloped 33 %<br>Bankrupt 5 % |
| Marketing Region of MSMEs | | | Local 24 %, Inter-province 42 %, Export 29 %, Bankrupt 5 % |
| Status of the Program | Completed (3 Year) 23 %, On – going 49 %, Transfer to another program 5%, Fail 23 % | | |

*Source: Kurniadi (2009)*

### 2.3.2. The period of 2009-2012 and afterwards

In 2008, the government launched a new UBC program to replace Vucer. Susilo (2010) argued that the background why the government changed the form of Vucer based on the following reasons:

- Both academics and professionals are often confused on the goals of the program. For example, the IST and Vucer have a similar goal and item.
- The multi-years Vucer failed to achieve its goal to improve the productivity and profits of business that produce export products.
- Universities are not able to comply with business targets, in particular, to get profits in a very short period.
- Academics were not fully interested in the program.
- Only universities from the mainland of Indonesia, for example Java, have succeeded to 'win' the competition.

Therefore, in 2010, the government introduced the UBC program named Technology and Science (TS) in a way to overcome problems noted above. Five themes of the TS programs included the TS for society, entrepreneurship, export products, innovation and technologies for region. Each of the TS programs has kept a similar goal to the previous ones a goal which is to foster academics of doing technology transfer in their region. The TS programs are more structured and cleared in the timeframe, and more funds are offered than its predecessor. As a result, the TS has given an impact that increases the participation of academics and universities in UBC. By compiling data from the DGHE we come up with Figures 3 and 4. These figures show the percentage of universities and academics in UBC during the period of 2010-2013.

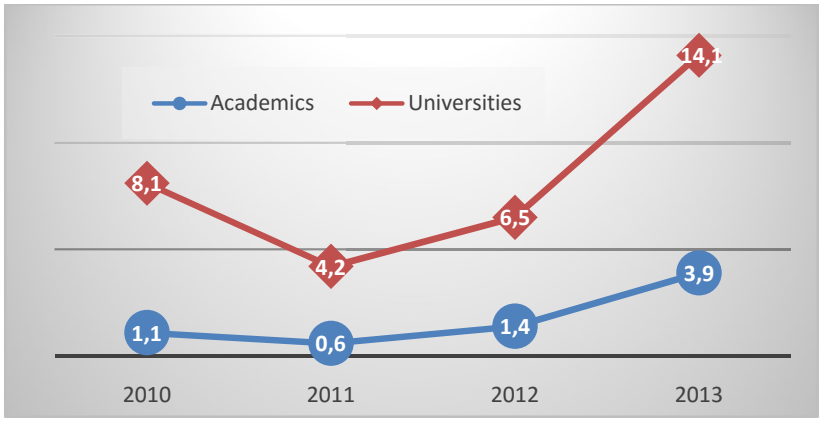


Figure 3: The percentage of universities and academics that engaged in (UBC) TS programs 2010-2013. Source: DGHE documents of Community Service Program 2010-2013.

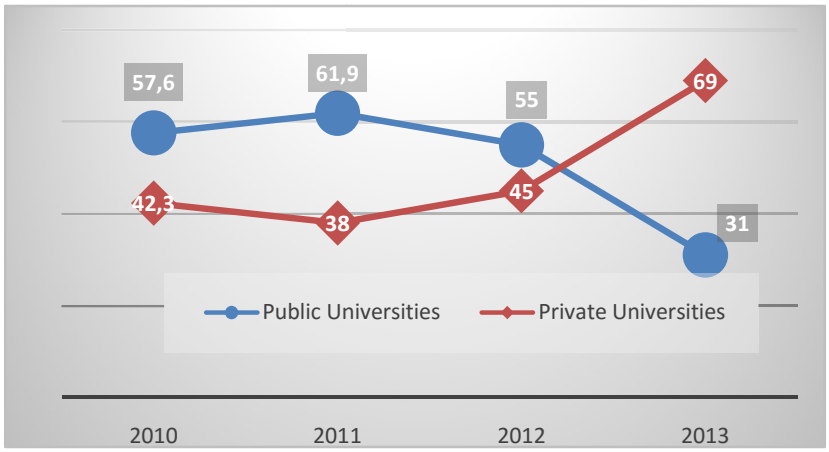


Figure 4: The percentage of public and private universities in TS programs 2010 - 2013. Source: DGHE documents of Community Service Program 2010 - 2013.

A big leap in participation by academics occurred in 2013. During this period, the DGHE simplified the bureaucracy associated with grant application by the support of information technology. Universities could easily track the status of the TS application online. Figure 4 shows that the public universities are in domination in the academics' involvement. The result is that, in 2013, private universities have increased their quality of academics, research capacities, infrastructures and the relationship with business.

### 2.4. Discussion

An innovation ecosystem remains a complex framework to be implemented because it involves actors with different institutional practices and beliefs operated in their own "institutional spheres" (Etzkowitz et al., 2000; Etzkowitz, 2002). Our study shows that government, with its funding policies, has been 'pushing' strict agendas of UBC. Universities in Indonesia are depending on the government policies and strategies. Van den Kroonenberg (1989) argues that these circumstances will influence UBC. He proposed an (entrepreneurial) university should be independent from the government and business. He noted that when a university depends too much on the government, it will result in paralysis because of bureaucracy; when a university depends too much on business, it will result in slavery. The present government agenda is to engage at least 30% of the academics in the UBC programs (Soewandhi, 2012). Increasing funding and cutting down bureaucracy have indeed influenced the attraction of a greater number of universities and academics to participate in UBC programs, as shown in Figures 3 and 4. However, bureaucracy cannot be the only reason for academics not participating in UBC as Davey et al., (2011) established this in the European context. There must be other reasons why UBC programs in Indonesia have failed to start up. The Directorate of Research and Community Service of Indonesia (2012) states that academics and professionals found it difficult to set up a co-operation because they have a different thought on the programs' goal and nature. KIN (2012) suggests that

many UBC programs in Indonesia have failed because the programs give fewer benefits to business. They also argue an effective sectoral coordination among government, universities and business is a necessary matter in order to reduce the different focuses of the actors.

Other 'factors' maybe at play and we suggest that approaching this from an 'institutional logics' perspective which will shed (more) light onto this situation. Thornton and Ocasio define the institutional logics as the 'socially constructed, historical patterns of cultural symbols and material practices, including assumptions, values, beliefs, by which individuals and organizations provide meaning to their daily activity, organize time and space, and reproduce their lives and experiences' (Thornton and Ocasio, 1999, p. 804). Accordingly, Merton (1973) argued that universities are founded based on the norms and values of science, and academics are trained to abide them. The world of business is populated with professionals who practice the logic of the market, are profit-oriented, and work in exogenous times (Cyert and Goodman, 1997; Elmuti et al., 2005; Lind et al., 2013). Because they 'live' in different organizations, they have different logics. Sauermann and Stephan (2013) state that universities and business are respectively 'operated' in different spheres: in the sphere of the "academic logic" and "commercial logic". The two worlds have their own norms and values which might be opposing to each other. The 'academic logic' emphasizes the search of fundamental knowledge and shapes the independences in research activities, peer recognition and the openness of the research results. The 'commercial logic' expects a different story. The business expects an applied research, limited disclosure or close dissemination of research results and private allocation of financial returns of research results (Sauermann and Stephan, 2013). Academics could perceive this as a benefit or as a threat to their academic career when they are involved in UBC. Further, academics are exposed to the logic of the university. Public and private universities might have different views on the 'value' of the UBC programs.

The evaluations of the UBC programs described in the section 'Evaluations of the UBC Programs in Indonesia' can be interpreted as being the result of differences in institutional logics. The UBC programs

originate as undifferentiated programs and expanded through the years, but the evaluation is not taking into account the differences between universities and business. To increase participation of universities and academics in UBC programs, they need to look at their own policies and strategies as well as find ways to overcome the differences in logics. We deduce from our study that there are three major issues that need to be addressed.

### 2.4.1. Differences in "language" and communication

Academics and professionals have a difference in 'languages'. Amalia et al., (2011) argue that 'language' problems are the main obstacles in the research implementation in Indonesia. Further, they argue that the 'language' and 'communication' problem are not only between academics and professionals but also among academics, professionals and government officers. The difference in the 'language' is an inhibitor of collaboration in the starting up of UBC. Many projects were failed to carry out because of the misunderstanding between academics and professionals. Academics often used words such as 'model', 'variable', 'ideas', while professionals give these words a different meaning (Cyert and Goodman, 1997). This has happened in many UBC in Indonesia with the result that academics and professionals did not have a common understanding regarding the goals and benefits of the programs. Moeliodiharjo et al., (2012) argue that the lack of understanding and trust between academics and professionals can hinder the UBC programs in Indonesia.

### 2.4.2. Differences in the nature of work and culture

Universities and business have a different work organization and outcomes. Universities have 'logic' to produce and to spread knowledge. Academics work in a well-defined timeframe and they have an ultimate goal to contribute in new knowledge, concepts, models and empirical findings (Cyert and Goodman, 1997; Lind et al., 2013). Professionals ex-

pect (high) profits in the short period and they used to deal with market that can change dramatically (Elmuti et al., 2005). Universities in Indonesia required academics to do a Community Service program as a part of getting the 'career credit'. However, this activity is sometimes regarded as taken for granted. Academics choose to do this activity in a short period, for example giving a seminar or short courses, rather than being engaged in a long term or in a big scope of UBC. DRCS (2012) found that many small enterprises were not interested in UBC because they cannot see that UBC will benefit them in a short period. Professionals argue that academics are too idealistic and, whilst being experts, they cannot contribute useful help and fast solutions, whereas academics consider professionals as money-oriented people, very practical minded and lacking idealism (Moeliodiharjo et al., 2012).

### 2.4.3. Bureaucracy

Before 2012, there were many administrative rules and procedures that academics must follow to apply the UBC grants. This would make a complex interaction among university, business and government. Moeliodiharjo et al., (2012) argued that the rigidity of the government bureaucracy has a strong impact on the academics' mindset. In other words, academics are having a thought that to apply the grant is a difficult task. In 2012 (see Figure 4), with less bureaucracy, many universities were successful to get the grants since the DGHE cuts bureaucracy, which resulted in less time being required and greater transparency and clarity.

## 2.5. Concluding remarks and future studies

The chapter has presented the UBC situation in Indonesian higher education which is designed to foster innovation in the way to reach the Indonesian ambition to be an innovation-driven country by 2020. One of the focal points of economic policy is to incorporate and involve universities in this endeavor by stimulating the co-operation between universi-

ties and the business world. To achieve this goal, the Indonesian government has prepared UBC programs to bring universities in many forms and shapes. One set as a critical point is to engage at least 30% of the total academics in UBC. Nevertheless, until 2013, the total academics who engaged in UBC are remained low, only about 4%. This number has not reached the critical point and even it is still too far. We argue that this is a result from the conflicting logics of two different institutions, universities and business. Besides bureaucracy, universities and business have differences in "languages" and the nature of works and products. Bringing universities to the innovation-ecosystem, as the government's goal, would mean a merging of logics. Future studies should focus on how university strategies impact the involvement of its academics in UBC and how academics cope with two different logics. Identifying barriers and obstacles would probably give a new perspective to academics to engage in UBC and how they manage the multiple logics in the complexities of UBC environment.

# Chapter 3

# Entrepreneurial incentives, obstacles, and management in university-business co-operation: the case of Indonesia[5]

**Abstract**

The study in this chapter aimed to explore the perception of university managers and academics towards incentives and obstacles of UBC. For this purpose, case studies were conducted in a public and a private university in Indonesia. Data was collected through semi-structured interviews with university managers: University Vice President and the Head of Research and Community Service Office; and with academics at the department of electrical engineering and computer science. The results suggest that both organizational actors at both universities share a common perception that industrial funding; organizational and individual reputation; trust from industries and applied research are the incentives in the creation of university-business co-operation; whilst bureaucracy, industrial commitment, different in vision and orientation, teaching obligation and basic research have been considered as the obstacles. This study proposes a managerial implication. University managers should "recognize" the "skills" of individual academics in business before engaging them in university-business co-operation. Furthermore, individual academics should able to manage the different vision and orientation with the business world.

## 3.1. Introduction

Creating UBC has become a necessity and a challenging task for universities worldwide. Although scholars have paid wide attention to identifying factors related to the incentives and the obstacles of such co-

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operation (Bruneel et al., 2010; D'Este and Patel, 2007; Arvanitis et al., 2008; D'Este and Perkmann, 2011); however, organizational actors such as university managers and academics may pose these factors differently in their efforts to manage relationships with the business world. University managers and academics may experience different difficulties and may require a different set of incentives to support UBC. For example, Freitas et al., (2013) argue that co-operation mediated by university managers mostly involves large enterprises, whilst co-operation that is initiated by academics mostly involves small firms. Addressing the perception on incentives and obstacles in university-business co-operation is important, especially in recent attempts to organize university-business co-operation in a more efficient and effective way (Cyert and Goodman, 1997; Barnes et al., 2002; Siegel et al., 2003). Therefore, investigating the factors perceived by university managers and academics is relevant, as better "interaction" between these levels may lead to a more efficient management of university-business co-operation (Geisler and Rubenstein, 1989; Campbell and Slaughter, 1999; Siegel et al., 2003; Glenna et al., 2007; Geuna and Muscio, 2009; Barbolla and Corredera, 2009).

The study presented in this chapter aims to contribute to understanding such "interaction". This study undertakes an exploratory qualitative case study analysis at two Indonesian universities and inquiries about these perceptions to both academics and university managers. Indonesian universities are useful in this study because UBC in Indonesia remains problematic (Van der Sijde et al., 2014; David and van der Sijde, 2015); suggesting various efforts to create co-operation still rely on the initiative of the higher education institutions. This chapter starts with an overview of relevant literature discussing the important factors identified in the initiation of the co-operation projects. Subsequently, the section describes selected universities in which the data was collected followed by the methodology. The final part of the paper summarizes the findings and provides implications for future studies.

### 3.2. Background

UBC has been discussed in a variety of channels and models (Rossi, 2010; Freitas et al, 2013). Such co-operation has been driven by personal or informal interaction (Link et al., 2007; Ponomariov and Boardman, 2008; Grimpe and Fier, 2010; Franco and Haase, 2015); and the formal ways including patents and licensing (e.g., Thune and Gulbrandsen, 2011). In conjunction with these channels in which UBC is driven, scholars have identified the incentives and obstacles of this collaboration. These can be summarized under three main categories:

(1) Resources and facilities;
(2) Personal relationship and institutional issues; and
(3) Research and teaching.

#### 3.2.1. Resources and facilities issues

Research has documented that the availability of funding and facilities influence the success of UBC (Schiller and Liefner, 2007; Kilian et al., 2015). Funding remains as one of the valuable incentives that promote academics to work with the business world. Either it is provided by the universities or industries, studies show that funding is highly correlated to the mobilization of researchers (academics and industries) from and to industries (Ranga et al., 2013) and to improve the academics' research performances (Gulbrandsen and Smeby, 2005). Schiller and Liefner (2007) argue that university managers consider funding is important as the forerunner for establishing UBC. Link and Siegel (2005) append that university managers should ensure the availability of fund at the first place before proceeding to design collaboration with the business partners. However, Davey et al., (2011) recommend that though a sufficient amount of funding is available, but it is not the only reason that drives academics to co-operate with business professionals.

Besides funding, the proximity (in the distance) between universities and business are widely discussed by UBC researchers (Ranga et

al., 2013; Hewitt-Dundas, 2013; Laursen et al., 2011). Ranga et al., (2013) propose that the proximity has made the collaboration between academics and professionals become easier and doable, and Hewitt-Dundas (2013) also agreed that industries which have established co-operation with local universities in a region can gain more benefits than the ones which established co-operation with non-local universities. Nonetheless, Laursen et al., (2011) argue that businesses which are being closer to low reputable universities would gradually reduce co-operation while when being co-located with the top tier universities, it will promote collaboration. Given this point, although the proximity in the distance between the universities and industries can support university-business co-operation in term of the researchers' mobilization, but, the reputation of a university including the reputation of its academics highly determine the interest of industries.

The performance of academics has been considered as the basis for developing a strong tie between university and business. Specifically, qualified academics whose had successfully involved in UBC have contributed to the success of joint Research and Development (R & D) held by universities and corporation. It means that the availability of high quality and motivated academics is one of the ingredients to propel the success rate of the university and business collaboration (Perkmann et al., 2011). Nevertheless, though the highly qualified academics are available, the university managers must keep aware that they might be failed in the attempt of creating UBC due to lack of knowledge and mismanagement of such resources (Barnes et al., 2002). While university managers have a privilege to formulate, design, and execute policies and strategies regarding UBC, they should acknowledge how the human resources at the university fit with the target (O'Shea et al., 2004). University managers are acquired to ensure that people, academics and business professionals, working in a 'comfortable' environment and they both should have a common interest (Geisler and Rubenstein, 1989; Elmuti et al., 2005). In summary, university managers must commit in the "exploiting" of the organizational resources such as people, time, and attention wisely, to avoid conflicts among them and to exchange of benefits and resources (Elmuti et al., 2005; Whipple and Frankel, 2000).

### 3.2.2. Personal and institutional issues

Studies have identified that mutual trust, commitment, mutual interests, and the intention from both sides to bridge the different interests play a role as important factors which related to personal (academics and professionals) relationships (Santoro and Saparito, 2006; Wright et al., 2008; Plewa and Quester, 2007; Davey et al., 2011). Plewa and Quester (2007) propose that trust is one of the key aspects for the success of UBC. Yet, Bruneel et al., (2010) suggest that the low degree of trust dissociates academics and business professionals, followed by the low degree of motivation. As the consequence, academics may interpret trust as a double-sided issue, some academics may perceive this as the driven factor and some others assume this as an inhibitor.

As trust can be treated as the driven factor as well as the inhibitor, yet, scholars still struggle to uncover the relation between trust and institutional gap. Bruneel et al., (2010) argue that a greater level of trust and prior experience in collaboration may narrow the gap between the two worlds. By being trusted by the industries, academics are expected to be an 'institutional entrepreneur' (DiMaggio, 1988) or they can be an 'institutional champion' (Ranga et al., 2013); suggesting that they capable to 'bring' the science into practice. Belkodja and Landry (2007) append that the risk-taking culture as suggested in many entrepreneurship literatures is claimed as the prerequisite to 'create' such institutional champion. The institutional gap may lead to an institutional 'resistance' that puts academics in two different institutions, the institutions of science and business (Cyert and Goodman, 1997; Elmuti et al., 2005, Lind et al., 2013; Sauermann and Stephan, 2013). Whilst the institutional resistance of business has indeed made the academics detained in their science sphere, for example in some cases of UBC in Canadian universities, however, the institutional 'proximity' between academics and industrial researchers turned out to be the incentives - indicated by several cases in the US universities (Ranga et al., 2013). Although the personal relationship and institutional issues have been identified by scholars, however, there is a gap in the literature to what extent these factors

have been perceived by the academics and how university managers consider them in designing UBC's strategies and policies.

### 3.2.3. Research and teaching issues

This category pertains to where academics must abide the university's activities such as research and teaching. With respect to UBC, academics perceive that the 'valorization' of their research is the pre-action to connect them with the business world. In this context, research commercialization has become the 'institutionalized' form of UBC that academics often undertake (Heng et al., 2011). Via research commercialization, academics can extend their collaboration with business by taking an opportunity to join in, e.g., R & D at the industries. Co-authorships in paper publication between academics and industrial researchers are assumed as a benefit for academics (Belkhodja and Landry, 2007). However, Fristsch and Krabel (2012) argue that UBC established through research is varied depending on academics' disciplines and the potential of their research for commercialization. Furthermore, Kilian et al., (2015) found that perception on the benefits of research collaboration is depending to the research group of researchers. Thursby et al., (2002) argue that the increased number of licensing is primarily due to the willingness of the faculty and managers to license on external R & D. To conclude, studies show that academics majorly perceive UBC can be created via research. It depends significantly on scientific disciplines and research groups.

The relationship between UBC and teaching are discussed by scholars. Wang et al., (2013) argue that in courses, especially in electrical engineering and automation major, UBC positively influences the curriculum and teaching effectiveness. However, Arvanitis et al., (2008) argue that lower teaching obligation is positively influencing the participation of academics in UBC. Accordingly, Schiller and Liefner (2007) propose that academics perceive that teaching is more important than university-business co-operation because teaching determines the track for academics' career. In summary, the relationship between teaching and UBC is bi-directional suggesting that teaching can influence university-business co-operation or vice versa.

Based on this literature review, it indicates that there are differences in views and perceptions that university managers and academics have about the obstacles and incentives of UBC. This study uses these three factors to probe the alignment of perceptions between the university managers and academics. Given by these points, when academics interpret any factors that can facilitate the UBC, they may perceive these factors as the incentives (Barge et al., 2008; Davey et al., 2011). In contrast, any factors that can hinder academics to engage with business-related collaboration are being interpreted as the obstacles (Barge et al., 2008; Davey et al., 2011; Ranga et al., 2013). The individual actors might perceive that the factors related to the drivers and barriers could be interchangeable, depending on locations, types, external regulations and the mission of their university. This leads to a research question, seeking to what are the factors for university managers and academics are the most identified as the incentives and the obstacles in university-business co-operation? In order to answer this question, an empirical study was conducted at two Indonesian universities to examine the interrelatedness between these organizational levels.

### 3.3. Method and data

Two universities in a region of West Sumatra in Indonesia were chosen (see Table 4). The first university is a public institution and an oldest research university with an established research excellency in Food Security, Pharmacy, Health, Disaster Management, Environment, Technology Innovation and Industry, Entrepreneurship, and Civil Society. The university has full research autonomy and can manage autonomously governmental funds (Unand, 2014). The university has been awarded an 'A' accreditation together with other 20 best public and private universities in Indonesia (Unand, 2014). With respect to its entrepreneurial activities, the university won an award for the best organization of a Business Incubator in 2014 (Unand, 2014). In Research and Community Service activities, the university relies on the Unit of Research and Community Service (Lembaga Penelitian Pengabdian Masyarakat, LPPM), which handles all funds and activities for research and community service. The other university is a private university, and one

of the oldest technical universities in the region. The university was initially founded as an Academy to provide specialized technical education. Over the years, it has developed and earned the status of a 'University' in 2002. The university serves research activities in technical domains such as Renewable Energy, Power Systems, Transportation, Informatics, Civil Engineering, and Survey Engineering. Because its research is highly applied-oriented, it has achieved several rewards in applied research. For example, the university won the Third Best of the National Award for Research Implementation, and several rewards of Technology Innovation in the regional level (ITP, 2013). Regarding the entrepreneurial activities, it has created a Unit for Research and Technology Implementation or Badan Aplikasi dan Penerapan Riset (BAPR) besides of LPPM, which founded to enhance research commercialization and technology transfer (ITP, 2013). Two institutions were selected to conduct case study analysis due to the variance in the type of institutions, the funding sources, sizes and the orientation in research and teaching which substantially differs. These criteria will allow for optimal comparability and enhance the similarities and differences across the cases.

This study approached the university managers such as vice president (Wakil Rektor) of co-operation and the Head of LPPM or the office of research and community service. These interviews aimed to obtain information about the university's scopes, strategies, policies, achievements on research, knowledge transfer and UBC. Academics were selected from the department of electrical engineering and computer sciences because of these disciplines are rapidly growing in Indonesia (DGHE, 2014). In Indonesia, research in engineering has been placed at the 1st position with 794 published documents and computer science is at the 4th place with 239 documents (SCimago, 2014). Further, the departments of electrical engineering and computer science were chosen because these disciplines have a close relation with the business worlds over decades (Noble, 1977; Denning, 2005; Bozeman and Gaughan, 2007; D'Este and Patel, 2007). Interviews were conducted in the topics of incentives, obstacles, academics engagement, prior experiences, etc. This study categorized the academics interviewees into two groups, expe-

rienced and inexperienced and did a pre-screening of their profiles before proceeding to the interviews. The selection was based on their research portfolios, the number of research collaboration projects, community service program, and grants from government and other stakeholders. Experienced academics are the ones, who have conducted and experienced in several UBC projects and have an extent working with people outside academia, and inexperienced academics are the ones who do accomplished, at most, a compulsory task of Community Service at the universities. This task obliges academics to work with business communities aimed to improve the competitiveness of small and medium-sized enterprises, entrepreneurs and other societal groups (DRCS, 2012). Both groups of academics are equal in terms of their academic profile.

Table 4: Profiles of the universities

| **Universities** | **Public** | **Private** | **Universities** | **Public** | **Private** |
|---|---|---|---|---|---|
| Founded | 1955 | 1973 | The Number of Academics (Persons) | >1000 | <500 |
| University Budget (Annually) | 10 – 100 Billion IDR* | <10 Billion IDR | • Academics of Computer Science (Person) | <50 | <50 |
| Status | Public | Private | • Academics of Electrical Engineering (Person) | <50 | <50 |
| Type | Research | Research (Technology) | The Number of Research Project (Annually) | >100 | 50 – 100 |
| Funding Sources | • Government Budget<br>• Student Fees<br>• Stakeholders | • Student Fees<br>• Stakeholders | The Number of the Third Mission Projects (2008) | >100 | <50 |
| Student (Persons) | >20000 | <5000 | The Third Mission Funding (Annually) | 1 – 10 Billion IDR | < 1 Billion IDR |

* IDR = Indonesian Rupiah

Table 5: Interviewees

| **Interviewees** | | **Public** | **Private** | **Total** |
|---|---|---|---|---|
| University Managers | Vice Rector | 1 | 1 | 2 |
| | Head of LPPM | 1 | 1 | 2 |
| | Director of Unit for Research and Technology Implementation or BAPR | | 1 | 1 |
| Academics | | | | |
| Dept. of Electrical Engineering | Experienced** | 4 | 4 | 8 |
| | Inexperienced* | 3 | 3 | 6 |
| Dept. of Computer Science | Experienced** | 1 | 2 | 3 |
| | Inexperienced* | 1 | 3 | 4 |
| **Total** | | **11** | **15** | **26** |

**Experienced with Business, *Inexperienced with Business

This study followed Merriam (1988) and Yin (1994, 1999) on exploratory case studies to interpret the phenomenon investigated and making an assessment. Although one of the main biases of case studies is that their conclusion is not statistically generalizable (Yin, 1994, 1999), however, this study aimed to understand the interaction between the managerial and individual level that might be applied generically (Hartley, 1994), even from a single case (Gummenson, 2000). This study relies on primary data derived from 19 face-to-face, 2 video-conferences with in-depth semi-structured interviews and 5 derived by email-interviews (see Table 5). In total, there were 26 interviews. Each of the interviews (excluding email-interviews) lasted from 30 – 40 minutes. The face-to-face and the video-conference interviews were transcribed verbatim to ensure its validity and were coded using the qualitative software tool Atlas Ti-7. An open coding was used to emerge the key themes and categories (Corbin and Strauss, 2014).

### 3.4. Findings

Table 6 summarizes results and describes that university manager and academics, in general, share a common perception for particular factors related incentives and obstacles. The perceptions depend on university types and academics' experiences. Subsequently, quotes illustrate this view.

Table 6: Summary of university managers and academics perception

| **Issues** | Public University | | | | | | Private University | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | Univ. Managers N = 2 | | *Academics* Experienced*** N = 5 | | *Academics* In-experienced N = 4 | | Univ. Managers N = 3 | | *Academics* Experienced N = 6 | | *Academics* In-experienced N = 6 | |
| | **I*** | **O**** | **I** | **O** | **I** | **O** | **I** | **O** | **I** | **O** | **I** | **O** |
| (1) Funding resources | | | | | | | | | | | | |
| • Funding from government | X | | X | | | | | X | | | X | |
| • University budget | X | | | X | X | | | X | | X | | |
| • Industrial fund | X | | X | | X | | X | | X | | X | |
| (2) Distance and reputation | | | | | | | | | | | | |
| • Local collaboration | | | X | | X | | | | | | X | |
| • University Reputation | X | | X | | X | | X | | X | | X | |
| • Individual Reputation | X | | X | | X | | X | | X | | X | |
| (3) Human resources and academics qualification | X | | | | | | X | | | | | |
| (4) Bureaucracy | | X | | X | | | | X | | X | | |
| (5) Mutual trust (trust from business) | X | | X | | X | | X | | X | | X | |
| • Industrial commitment | | X | | | | X | | X | | | | |

| | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| (6) Vision and orientation | | X | | X | | | | X | | X | | |
| (7) Research and Teaching in UBC | | | | | | | | | | | | |
| • Teaching and UBC | | X | | X | | X | | X | | X | | X |
| • Research and UBC | | | | | | | | | | | | |
| ○ Applied research | X | | X | | X | | X | | X | | X | |
| ○ Basic research | | X | | | X | | | X | | X | | X |

*I = Incentives, **O = obstacles, ***Experienced with business

### 3.4.1. Perception towards funding resources

University managers at both universities certainly perceive the availability of funding as the basic incentives (see Table 6). However, their perceptions on this resource are divided. Managers at the private university argue that funding from industries has attracted more academics than with a UBC that funded from the government agencies. This is due to this university has a deficit in the budget and has allocated less than 10% of the annual budget for community service program (see Table 4). Oppositely, managers at the public university implicitly argue that their university has no issues on funding. They suggest that funding resources either from industries or governments or university budget have facilitated academics in UBC. The public university has sufficient funding-resources for UBC as a university manager at this university spoke:

"Principally, we accommodate this (UBC), we did it based on the number of funds from the DGHE (Directorate General of Higher Education), and if we do not get the funds from the DGHE, then we offer the UBC funds of our university (budget), which we manage the funds independently." [A12]

Academics at both universities perceive funding as the incentives (see Table 6). Experienced academics have a different perception compared to the inexperienced ones about the reasons why the availability of funding is important. At the public university, where funding is available, experienced academics may involve in UBC either based on university's projects or by industrial funding. An experienced academic at the department of electrical engineering at the public university states that:

"I used to involve in the UBC-type project (Community Service). We worked on that because of the Dean assigns us to do so. So, I never initiate the program by myself because the university has the fund to facilitate the program. The program is part of our credits as an academic and it is obligatory. By UBC, all I expect is to be renowned by the business nothing more. Because I will get less money from the UBC I have done." [A7]

Experienced academics at the private university mostly perceive UBC may only be driven by industrial funds. They assume that their university is not able to support UBC due to the lack of budget, except a support from the government via UBC grants even these were also highly competitive. An experienced academic at the department of electrical engineering of the private university proposes his view:

"UBC is for financial income and for our reputation in the world of business. I know that in some countries in order to be a lecturer, a person should have an industrial experience. They become a professional (in the field). What we do here is in the opposite way, be a lecturer at first and then apply the field to the industries. There are some colleagues who just stay 'reading' the textbook." [B2]

The quotes above indicate that while university managers and academics at both universities agree that funding is the main incentive, but their perceptions toward funding are assembled into two directions. First, university managers and academics from private university share a common perception that funding from business is more eligible than funding from universities or government agencies. Second, university managers and academics at the public university share a common perception that there is no issue in funding.

### 3.4.2. Perception towards proximity (in the distance) and reputation of academics and universities

Concerning to proximity (in the distance), none of the university managers suggest this issue. Academics, in general, argued that they prefer to collaborate with local industries because it is doable and easier. Interestingly, one of an experienced academic of electrical engineering at the public university states that:

"For research collaboration which needs data from the industrial partners, distance is not a matter because of we can communicate online." [A2]

This result highlights that proximity in distance is the incentive for UBC because academics may interact with business in the region. Because of these universities are located in a region, the academics consider the similar perceptions. In addition, Table 6 shows that university managers and academics perceive UBC can improve the university and individual reputation. University managers argue that the involvement of academics in UBC can improve their university reputation via research (publication) and accreditation. A university manager at the public university suggests that:

"This (UBC) is not just about having cooperation but also improving the universityreputation, including (our university has been granted with) the 'A' accreditation. If we compare to other 'A' universities, which are most located in the mainland, our university has conducted distinctive research achievements." [A12]

A university manager at the private university agrees with this statement as he says that:

"(Co-operation with business) impacts both the university and academicreputation. Moreover, universityreputation is an aggregate of the individual (academic) action. Only, most of the time our academics are only interested in appliedresearch and professional activities. They have experience in business, but they are not keen to write it down as papers. That is the problem. Actually, there is a lot opportunity to get a new problem for research (cooperation), but anyway they (academics) are just interested at money." [B14]

In line with this statement, an inexperiencedacademic at the computer science at the public university, he argued that any academicsparticipation in university-business co-operation was not only intended to improve the individualreputation but also it contributes much to university reputation.

"I was (mostly) assigned by the university to do that (UBC). It gives many contributions to university's reputation and to our faculty. I was assigned by the President of the university. I was called by them (President's office). Then, I

work (in university-business co-operation) as professionals because I should do such that (thing)." [A9]

However, academics at both universities consider UBC improve their reputation in business not in science. An experienced academic at the public university at the department of electrical engineering agrees shows his concern:

"My motivation to work with the business is (1) to develop and create networking; (2) to be renowned by the industrial partners so I can encourage my students to get an internship or to have an industrial-related thesis; (3) tangible and intangible values. My main motivation is to show that I can solve problems faced by the industries that relate to my expertise." [A1]

This aligned with an inexperienced academic at the private university in computer science department suggests that UBC is benefited her:

"Money and financial incomes, further, of course, my reputation in the business world." [B12]

Furthermore, at the public university, academics, in general, considered UBC as the basic platform to support their research agenda and to improve their reputation in the business world. For example, an inexperienced academic at the public university from the department of electrical engineering states that:

"Actually, (from UBC) I just want to be renowned (as an expert) by the industries. I gained not enough financial returns from this (UBC). For example, I was involved in a project as the planning expert within a governmental department. But I gained less money out of it. It was not worthy for me compared to my contribution to that project." [A7]

This aligns with another experienced academic at the department of electrical engineering of the private university. He implies that from UBC he did not expect more on financial returns or getting industrial funding for his research but rather in individual reputation by solving the industrial problems. He states that:

"Through UBC, I interact with the colleague from universities and business. Therefore, my role and my contribution in UBC is the starting point to increase up my position at the university [ ] my motivation is to show that I can solve problems from industries that related to my expertise. This is because the industries are used to see us useless. For them, academics are not able to solve their problem. Another factor is to create a good networking." [B2]

The data show that university managers and academics have a common perception about UBC can improve the university and individual reputation. Only, this chapter highlights that there is a different perception to interpret reputation. University managers tend to interpret reputation of their university as reputation in science or academic achievement whilst academics perceive that they aimed for reputation in the business.

### 3.4.3. Perception towards human resources and qualification of academics and universities

Both universities allocated grants for the community-service program (see Table 4) annually to facilitate academics to work with business societies. Although both universities have differences in size and the amount of funding but university managers perceive that the availability of funding and qualified academics influences the success of UBC. For example, a university manager of the public university states that the importance of qualified researchers:

"They (academics) have produced research that can be commercialized and some of them sold the product into the market. They (academics) have their own business counterparts in our region and those societies have been their market. We (as an LPPM) accommodate them to do this, but if they want to do this personally, it is up to them." [A11]

This is also aligned with a university manager of the private university. The availability of qualified human resources is the main point to be

accounted from his point of view. Whilst his university is small and is only focusing to technical education and research, but he considers this as the advantage to get closer to the business. He argues that academics in his university are sufficiently qualified to do research both in applied and fundamental. He states that:

"In average, our staffs (academics) have good experiences in professions. They are not only having experiences in the world of science and academic research. They professions and experience in the world of business is sufficient, they are not a novice anymore." [B14]

Both university managers perceive that their universities own qualified academics researchers for research and technology transfer. With funding compensation in each community service Program, the universities expect high participation of academics in the program. Although it cannot be said that the participation of academics in community service program has indicated the successful of UBC, there will be some reasons for academics to be involved in such programs.

### 3.4.4. Perception towards bureaucracy

University managers and academics at both universities agree that bureaucracy as the main obstacles for university-business co-operation (see Table 6). The term of bureaucracy appeared from our interviews in which it is correlated to difficulties to get funding from the government and university budget. For example, the private university often fails to "win" the university-business co-operation grant offered by the governments. Managers state that one of the issues is that UBC grants or research funds acquire academics to have research collaboration that fits with their research portfolios. This indicates that academics who collaborate with business in research will have difficulties in incorporating the basic and applied research. Nevertheless, he agreed that university-business co-operation will benefit his university because the university may obtain external funding for research and education. He argues:

"University-business co-operation allows us to realize a 'dream' for our (university) product. This may be the simple goal of university-business co-operation with respect to (gaining) profits. For us, university-business co-operation means profits, because the main source of the university's funding is from the students' tuition fees. And of course, we need more funds from products we sell. We are interested to get income including by 'selling' the expertise of our academics." [B14]

### 3.4.5. Perception towards mutual trust and commitment

University managers and academics have a common perception about trust from the business may enhance university-business co-operation (see Table 6). Both universities posed difficulties to cooperate because industries were not interested to use products from universities. When being asked which organization was the initiator for university-business co-operation, a manager at the public university suggests that:

"In average, universities initiate university-business co-operation. This is because industries yet not 'acknowledge' the research and technology produced by the universities. This is also because of the lack of grants from the government to facilitate research. (Our) researchers are not the priority (yet). Not just at our university, not many industries 'want' to buy our research. For example, a renowned technical university which produced the railway concretes but it was sold and patented by a Japanese company." [A10]

The efforts of the university to commercialize its research results were encompassed to eliminate this trust barrier. The head of the LPPM of the public university argues that his university is trying to "invite" the industries. However, the co-operation will happen if the business professionals interested on the universities' products. When being asked who the initiator of university-business co-operation is, the head of LPPM at the public university suggests that:

"So, there are two possibilities. When there is an expo held by other institutions such as the science and technology organization, we had been invited. The first possibility is we showed our products (research products), the ones which are protected by the Intellectual Property and the other ones, the product which can

be commercialized. Second, there might be individuals or groups who interested to our products." [A11]

Accordingly, a manager at the private university suggests the similar idea with the managers at the public university. He argues that university-business co-operation is the condition where businesses have a trust to use their product. Moreover, university manager and academics at both universities perceive that industries have often a lack of commitment. Most of the academics suggest that the businesses are likely "changing" from what have been agreed in the project. An experienced academic at the department of electrical engineering at the public university states that:

"In co-operation, for example, when we have a project in the design and electrical installation, there is a lack of commitment has occurred. First, I designed those based on our planning, they (business) agree with that in the first place, but then they change it in the middle of the project." [A7]

University managers and academics agree that up till present university-business co-operation is mainly the initiatives of the university. This is due to "lack" of trust from business to use university research and product. At the same time, academics perceive that industries are a lack of commitment considering university-business co-operation is hard to evaluate and be finished.

### 3.4.6. Perception towards differences in vision and orientation between university and business

The lack of trust and commitment between universities and business have been identified by scholars and suspected as the major barrier (D'Este and Patel, 2007). However, university managers and academics at both universities argue that the main obstacles are differences in vision and orientation suggested these should be resolved at the first place. Interviewees have mentioned aspects related to differences in the institutional orientation such as differences in perception, vision, mission, characters, goal and etc. For example, a university manager at the

private university believes that the differences in the perception and the necessity between the universities and business are the prominent barrier of university-business co-operation. He argues that:

"The classic barrier is that first that any other institutions outside the universities have different needs and perception. It is not easy to combine that perception. The two institutions have differences in mission and we try to find a point where we can be together. We are not dependent and not having a clear relationship. It means that if we are not having cooperation it will be OK for them. But this is not good. For example, if we graduate students without sufficient qualification and business will reject them." [B14]

### 3.4.7. Perception towards research and education (teaching) and UBC

University managers and academics from both universities argue that high working load at the university hinder academics to collaborate with business. A university manager at the private university states his concern about this situation:

"There is another problem of our academics, the high demand for university's duties (teaching and research). They (academics) spent a lot of work of teaching." [B14]

An inexperienced academic at the private university at the department of computer science suggests that the working load at the university have distracted academics to work with business.

"There is a negative effect, academics who often working with business will leave their core task which is teaching, this is because he has a number of appointments so her or his time more in business." [B12]

Furthermore, an experiencedacademic at the private university from the department of computer science argue that his discipline is much applied and is based on contextual based. Co-operation with business has improved his teaching reputation since his include examples from real cases. He stated that:

"Collaboration with business has given a positive impact (for my career). Experiences with business, such as in SystemDevelopment, InformationSystem, TechnicalSupport; have inspired me to make good examples for my students. I can tell the story (to my student) this is the real condition." [B9]

In line with this statement, academics find that it is difficult to work with business in term of combining the fundamental and the applied research. Academics argued that they will conduct research that based on the demand of business. An experienced academic at the department of electrical engineering at the public university state that:

"I think it is difficult to combine research that has a business orientation with fundamental research. I think to solve this problem is to set a collaborative research. The fundamental research has a long schedule. This makes researchers spend a lot of time, costs, and facilities. To combine these research, there should be sub-research that focus to what have been applied in fundamental research." [A4]

Furthermore, an inexperienced academic at the department of electrical engineering at the public university perceive that fundamental and applied research are different, but he states that this will be the university responsibility. He states that:

"Businesses are not interested at fundamental research because they do not see any return of investment. One of the alternatives to solve this problem is Corporate Social Responsibility which has cared for education and research." [A2]

The relationship between teaching and university-business co-operation is bi-directional (Wang et al. 2013; Arvanitis et al. 2008; Schiller and Liefner, 2007). The results indicate that at one hand academics see the benefit of university-business co-operation improving their teaching, but in the other hand they prioritize teaching and spent a lot of their time in it. In research, the data indicate that academics are in dilemmatic situation suggesting they posed to conduct fundamental and applied research.

### 3.5. Discussion and conclusion

The main objective of this study was to explore the perceptions of university managers and academics toward recent issues of UBC. This study uses three categories as follows to investigate the 'alignment' or 'misalignment' of the perceptions toward: resources and facilities; personal relationships and institutional issues, and the relation between research as well as teaching with UBC. The previous section sorts the results into seven findings and this section discusses these findings consecutively. First, in *resources and facilities* factors, such as the availability of funding, it indicates that funding has been perceived as the main incentive suggesting university managers and academics in each university share a common perception about the importance of funding. Such findings support the studies from Schiller and Liefner (2007) and Kilian et al., (2015) who suggest that the availability of funding has been assumed as the forerunner of university-business co-operation. University managers are aware that the availability of funding can mobilize the academics to collaborate with business, as suggested by Ranga et al., (2013). However, university managers at the public and private university have a different view about the source of funding. While the public university has no difficulties to obtain funding from the government, the private university is struggling to have funding from government and stakeholders (including student). Therefore, the private university has only one option to obtain funding only from the business partners. Second, our results (Table 6) suggest university managers and academics at both universities perceived that industrial funding is the main incentive. This finding is aligned with a study by Gulbrandsen and Smeby (2005) that suggest it will be easier for academics to obtain funding from industries rather than from other stakeholders.

In *proximity and reputation*, our results support the study of Laursen et al., (2011) who suggested that proximity (in distance) is less important than reputation. Indeed, academics in this study tend to co-operate with local industries; nonetheless, by involved in UBC, academics have sought for reputation in business or 'professional reputation'. Oppositely, university managers perceive that UBC contributes significantly to the reputation of the university in science and academic

achievement. Our study notifies that there is a 'misalignment' between university managers and academics regarding on what they refer as the 'reputation'. Furthermore, in *human resources* and *qualified academics*, university managers perceive the academics in their universities are qualified to involve in UBC. There is a tendency that university managers are overestimating the academics qualification or experiences (with business) so that they are unaware about the capability of academics and the target of UBC, as indicated in the previous studies such as Barnes et al., (2002) and O'Shea et al., (2004).

Experienced and inexperienced academics with business suggest a clear division regarding their perception towards the incentives and obstacles of UBC (See Table 6). In *personal relationship* such as industrial trust, our finding suggests that university managers and academics share a common perception about trust from business which is significantly influencing UBC. This finding strongly supported the study of Bruneel et al., (2010) suggesting that low trust from business is the inhibitor for UBC. As the consequence, the differences in the institutional "logic" are remained as the classic obstacles for university and business to cooperate. The data indicate that interviewees annunciated that the sphere of science and business are totally different, as studies conducted by Cyert and Goodman (1997); Elmuti et al., (2005); Lind et al., (2013); Sauermann and Stephan, (2013). Both profiles of the interviewees (academics and university managers) perceived a common opinion about the different vision and objective between university and business, which these become the major obstacles. In relation with *trust*, the results also revealed that experienced academics tend to reduce the institutional gap through mutual trust though it is difficult to merging these two worlds (Bruneel et al., 2010). Last, in the *research and teaching issues*, the results indicate that UBC and teaching is interplaying to each other. This result is aligned with the study of Wang et al., (2013) in which UBC influences the quality of teaching. However, the results indicate that teaching has been considered as the obstacles because academics acquire much time to teach and it has been a priority, as studied by Arvanitis et al., (2008). In research, although university managers and aca-

demics perceive that UBC can be conducted via applied research and or research 'valorization', however, academics perceived that applying research would be difficult. Because applied and basic researches are different, academics argued that these types of research cannot be merged into one but still they are separated.

Indeed, although both universities are different due to type, funding and academics, which are separated into two disciplines, our study highlights that a general perception towards factors included in incentives and obstacles. Based on the results in Table 6, this chapter concludes that factors of incentives and obstacles are clear and separated. First, both organizational actors at both universities share a common perception about the incentives of university-business co-operation which consisted of industrial funding; organizational and individual reputation; trust from industries and applied research. Second, organizational actors at both universities considered bureaucracy, industrial commitment, different in vision and orientation, teaching obligation and basic research are the major obstacles for UBC.

### 3.6. Limitation, implications and future studies

This study, although with limited data and case studies, attempts to represent the position of a university in UBC through their capabilities in resolving the obstacles and utilize incentives. Using two sets of research setting, a public and a private university, this study aims to illustrate how university managers and academics at both universities perceive the incentives and obstacles of UBC. Public university represents a university that have a close relation with the government, whilst the private university represents a university that have a close relation with business. However, both universities were trying to get "closer" with business society and government simultaneously; and both universities "use" their academics as the "agent" for UBC. Based on the results, this study provides an implication for the management of UBC especially for these types of universities. For both universities, university managers should "recognize" the "capability" of their aca-

demics in business collaboration because when keep pushing strict collaboration agenda such as the public university did, it is not always successful. Managers at public university should consider giving more "freedom" for academics, so the traditional university-business cooperation through Community Service programs would not be only as taken for granted. The different implication is proposed for the private university. Although the private university in this study has the BAPR and the Community Service programs have been conducted twice in a year, it seems like that more 'formal' engagement should be taken into account. Because the university is not dependent to the government funding; and university managers and academics perceive UBC is totally personally driven, it proposed that the university should construct a channel of UBC formally in order to increase the participation of academics. Hence, cases from two universities may lead to future studies. Since both types of universities have considered academics as the important actors to implement the policy of UBC, future study will encompass on how academics deal with the business world regarding e.g. the personal and institutional issues such as industrial commitment, different in vision and orientation, and teaching obligation.

# Chapter 4

# Academics coping with business logic: a study at Indonesian universities[6]

**Abstract**

This chapter presents coping mechanisms that address competing institutional logics in UBC. We examined academics at two Indonesian universities and in two science fields, computer science and electrical engineering. Our findings suggest that the level of experience of the academics with business determines the level of their adherence to business logic and determines their coping strategies. Via participation in UBC, academics can act as a hybrid who bridges the two worlds by "compartmentalizing" them. The study has two implications. First, it provides a recommendation for policy-makers to be purposively selective when engaging academics in UBC e.g., grants. Second, this study infers that inexperienced academics must "learn" in advance about the logic of business before involving themselves in collaboration with business projects.

[6]The chapter is authored by Firmansyah David, Peter van der Sijde, Peter van den Besselaar and it's been under review by the Journal of Engineering and Technology Management (JET-M). Elsevier.

## 4.1. Introduction

Building a partnership with business communities has become a challenging task for universities worldwide (Etzkowitz, 1998; Siegel et al., 2001; Sauermann and Stephan, 2013). Many initiatives have aimed to investigate the inter-organizational issues, specifically with respect to how members of both types of organizations overcome the conflict of two institutional spheres, that is, between science and business practices (Cyert and Goodman, 1997; Elmuti et al., 2005; Jones, 2009; Bjerregaard, 2009; Lind et al., 2013). For instances, continuous learning and restructuring processes on both sides are the essential factors needed to narrow the chasm of cultures and norms between academic researchers and business professionals (Elmuti et al., 2005). Similarly, Bjerregaard (2010) suggests that both academic scientists and industrial researchers should use their (social) skills purposively to bridge these institutional gaps.

Based on these studies, examining the attitudes of academics dealing with these institutional demands is become crucial. This is due to that individual academics have been exposed with new societal pressures such as new public management in the science system, in general, and in the higher education, in particular (Ferlie et al., 2009). Such new policy relates to the attempt to increase the role of science in industries (Hoarau and Kline, 2014) and relates to the significant impact of industry fund that increases the number of academics to work with business (Bozeman and Gaughan, 2007). Moreover, academics may be exposed by two cultures and norms, science and business, as universities worldwide have endeavoured to 'valorise' research (e.g., Mitev and Verters, 2009) of which scholars often label this as research commercialization (e.g., Lam, 2011). Academics may find this problematic because these values and practices are contradictory and divergent to each other (Jones, 2009; Bjerregaard, 2009; Evans, 2010; Murray, 2010). To successfully participate in UBC, individual academics should create hybridity in these (two) contradictive logics (Murray, 2010) which imply that they should able to diminish this institutional barrier (Bjerregaard, 2010). Additionally, the "Mode 2" of research may vary across scientific fields (Whitley, 2000) suggesting academics in different field may react differently for UBC.

UBC is a framework that represents a complex interaction among institutions – between science and business, organizations – between universities and firms, and among individuals – between academics and business professionals. Out of many variations for discussing the inter-relationships among these entities, the discourse on the role of individuals in the transformation of organizations and institutions is among those variations that have received less attention from institutional scholars (Thornton et al., 2012; Pache and Santos, 2013). For example, Lee and Lounsbury (2015) emphasize the importance of organizational actors in which they can shape the organizational responses toward institutional complexity, both directly and indirectly. These authors suggest that organizational actors may indirectly respond to the first order of logics or field-level of logics e.g. state and market logic. Instead organizational actors may directly respond to the second order of the logics named community logics such as political conservative and pro-environmental.

Accounting for individual actors in our study is important because they may shape or reshape the micro-foundation of institutional logics (Thornton et al., 2012); they play crucial roles in the forming of hybrid organizations (e.g., Pache and Santos, 2013, Murray, 2010); and they contribute significantly to institutional changes and praxis (Friedland and Alford, 1991; Townley, 1997; Seo and Creed, 2002; Battilana, 2006; Binder, 2007; Montgomery and Oliver, 2009; Reay and Hinnings, 2009). Several studies of UBC have attempted to explain the role of individual academics in the on-going 'production' or 'reproduction' of new values and practices. Shane (2004) and Lam (2011), for instances, argue that the commercialization of research results has become the main 'business logic' for academics to collaborate with industries and to create spin-offs. Following this direction, Greenwood et al., (2011) argue that academics may recognize 'business logic" as "commercial logic" and the authors describe "business logic" as the 'propriety retention and commercial exploitation of research results' (p.318). These studies suggest an interesting insight in which individual academics are varied in their respond to business logic, suggesting some may cope working with business successfully and others may be not (e.g. Sauermann and

Stephan, 2013). Nevertheless, few studies have aimed to expose the strategies and response of individual academics towards the contradiction between business and science logics.

Our current study aims to respond to this dearth of research by providing empirical evidence on how macro-actions influence micro-actions (Coleman, 1994), particularly in a case in which individual academics are exposed to business logic, resulting in a competing institutional logic (Pache and Santos, 2013). The long term and the structured UBC programs in Indonesian universities provide us with an empirical site to study and advance this knowledge. Under a framework of the "third mission" of universities and the industrial research collaboration, a growing number of UBC projects have been initiated in recent decades by government agencies (and stakeholders) and universities to stimulate the academics' engagement. Given this point, Indonesian universities and their academics have been 'exposed' to the logic of business for decades, and they simultaneously attempt to 'develop' such logic. Thus, this paper seeks to answer the following research questions: How do academics cope with competing institutional logics as being exposed or participated in UBC? And what are the academics' roles and responses under the complexity of UBC?We structure the remainder of the paper into four sections. The first section is a conceptual framework that describes the concept of the institutional logics and the operationalization of the science and business logics. The second part presents the data collection and method consisting of the selection of research sites and cases. The third part is the results' section and describes the data collected. The last part constitutes discussion and an implication for future studies.

### 4.2. Conceptual framework

Thornton and Ocasio define institutional logics as the 'socially constructed, historical patterns of cultural symbols and material practices, including assumptions, values, [and] beliefs, by which individuals and organizations provide meaning to their daily activity, organize time and

space, and reproduce their lives and experiences' (Thornton and Ocasio, 1999, p. 804). Departing from this premise, we adopt the Mertonian norms (Merton, 1973) and the Intellectual and Social Organization of Sciences (Whitley, 2000) to operationalize the core elements of the science logic. As the counterpart, we adopt the counter-norms of Merton to operationalize the core elements of business logic (Mittroff, 1974), showing the values and practices of business used in university-industry strategic alliances (e.g., Cyert and Goodman, 1997; Elmuti et al., 2005; Lind et al., 2013).

### 4.2.1. Institutional logic of science

Merton (1973) proposes the general elements of how academics 'practice' science. He argues that academics produce and reproduce their research and teaching materials under the norms of (i) universalism – all academics can contribute to science, (ii) communalisms – an equal access to scientific goods and collective collaboration, (iii) organized scepticism – critical scrutiny of scientific claims before being accepted, (iv) disinterestedness – academics aim for a common scientific goal, rather than for personal gain. These Mertonian norms have been considered the first systematic approach to sketch out the normative isomorphism of science practiced by academics worldwide (Mulkay, 1980; Collins, 1982). Moreover, Whitley (2000) specified these norms and proposed that, in knowledge production, academics are mutually dependent upon one another and are doing research under uncertainty. The mutual dependence guides academics in recognizing their colleagues or peers which embodied as functional and strategic dependency. The functional dependence relates to a situation in which academics must use methods, procedures, and results corresponding to their peers' results and procedures. This dependence can be high in fields that have highly standardized procedures, such as several Sciences, Technology, and Engineering fields but also in Economics and Psychology. In other fields, such as several general Social Sciences and Humanities, this dependence can be low because these fields have only a limited number of shared procedures.

Furthermore, the strategic dependence relates to the process of peers or colleagues' evaluation, suggesting one may be very dependent on the fields' elite for research resources, publication outlets, and position, but others may be less dependent. This variation indicates that strongly organized fields have a strong identity, and clear powerful elites; whereas weakly organized fields have a weak identity and less powerful elites. In task uncertainty, Whitley (2000) proposed the concept of the strategic task and technical uncertainty. The strategic task uncertainty refers to a degree of uncertainty in which a field of science is moving. This uncertainty can be high if field priorities are clear (for example, everyone is searching for the Higgs particle) or low when field priorities are unclear (as in many Social Sciences and Engineering fields). Subsequently, technical uncertainty refers to technical instruments and infrastructures used in research. In some cases, this uncertainty is undisputed and, therefore, a low technical-uncertainty goes with those instruments – but it may be high in other fields.

### 4.2.2. Institutional logic of business

UBC introduces the logic of business to academics. When academics conduct applied research or they happen to be working with business professionals, they will inevitably address the logic of science and the logic of business simultaneously. Because the logic of business is proposed to be the opponent to the logic of science as suggested by many studies (Cyert and Goodman, 1997; Elmuti et al., 2005; Lam, 2010; Lam, 2011; Murray, 2010), we use the counter-norms of Merton proposed by Mittroff (1974) to categorize the elements of business logic. The norms are as follows: (i) Particularism – a boundary in knowledge production, (ii) Solitariness – secrecy in findings and results, (iii) Dogmatism – following the incontrovertibly true set of rules, and (iv) Interestedness – personal interests rather than communal. For example, the world of business is highly related to competition, secrecy in Research & Development (R&D) results, and the planned products should meet the demands of the market (Cyert and Goodman, 1997; Elmuti et al., 2005). Furthermore, in the business world, (i) academics should not publish

the results of research for the open community; (ii) research should meet the market demand, and (ii) the results should be produced in the agreed time (Cyert and Goodman, 1997; Elmuti et al., 2005, Lind et al., 2013). Table 7 shows the comparison between these two logics.

### 4.2.3. University's valorisation activity and co-operation modes

Universities have been practicing the institutional norms of science as the common practices of their organization (Merton, 1973). Nevertheless, for decades, universities have extended their mission to service the community or to 'valorise' the knowledge produced in addition to teaching and research (Perkmann et al., 2011; Sam and Van der Sijde, 2014). Engagement with social and business society have caused universities to adapt their organizational policy and strategy to be coherent with the logic of business. Aligned with this logic, universities 'changed' their research strategy to one that is 'closer' to the demands of business. Universities shifted part of their research orientation from 'Mode 1' – research is produced to gain scientific reputation, to 'Mode 2' – research is produced in the context of application (Nowotny et al., 2003). Consequently, academics may be in a dilemma of whether to adhere to such an organizational strategy or policy (Swan et al., 2011). Subsequently, academics who engaged in a UBC project (for example, in industrial research collaboration) must comply with the logic associated with this mode. In 'Mode 1' of knowledge production, the science logic rules, whereas in 'Mode 2', academics enter a potentially dilemmatic position. The relation between co-operation modes and institutional logics is still understudied. These modes are varied depending on their nature and objectives. Abreu and Grinevich (2013) defined these modes consist of, among others, formal and informal channels. The formal modes of the co-operation often through IP protection method which are more engaged more senior academics than the younger ones. The informal modes may be formed in the creation of new physical facilities, consultancy and contract research, joint research, training, and meetings and conferences (D'Este and Patel, 2007). However, the field of science gives an edge to these co-operation modes. The physical

sciences and engineering are more formal in form and that in the social sciences, creative art and humanities, will favor more informal activities: as different modes may function differently in different fields (Whitley, 2000). We propose the formal modes of UBC may originate from fields that have high dependency because results of research in the field constitute of products and new methods. The informal UBC may originate from fields that have high uncertainty because it is seek to problem solving and solution. Nevertheless, the more complex modes of UBC such as Technology Venture (Ranga et al., 2013) require a high integration of business logic into science practices resulting in high level of hybridity (Bjerregaard, 2010; Marques et al., 2006). In our study, we focus on the coping strategies taken by the academics towards divergent logics, which then may form the modes of UBC.

Table 7: Science and business logic and their operationalization

| Science Logic (SL) | | Business Logic (BL) | |
|---|---|---|---|
| **Merton (1973, p. 270 – 278) (General)** | The Value of Mertonian norms in Whitley (2000) (Disciplines) | The Mitrroffian Norms and Th Norms of Business (Cyert an Goodman, 1997; Elmuti et al 2005; Lind et al., 2013) | Mittroff, 1974 (Proposed the Counter-norms of the Mer tonian norms) |
| Universalism | **Strategic Dependency** | **Competitiveness** | **Particularism** |
| • Equality in science an not depending on personal an social attributes.<br>• Adhered to Universalisti Standard.<br>• Collective Contribution | • Collective Goal<br>• Clear Elite/Peers<br>• Recognition from Peers Only<br>• Core Journal/Publication<br>• Field Identity<br>• Research Agenda | • Better than competitor<br>• Survive in high competen environment | • Boundary of knowledge productio such as countries or organizations.<br>• Judging to Personal Knowledge |
| Communism | **Functional Dependency** | **Disclosure** | **Solitariness** |
| • Findings of science ar assigned to the community.<br>• Common Ownership<br>• Collective Collaboration | • Standard methods and proce dures<br>• Sharing ideas with colleagues<br>• Influences of colleague (s work to the individual work<br>• To match work with col league(s) work<br>• Dependencies on other field (s | • Close-disclosure c research results, e.g. Patent, In tellectual Property etc.<br>• Competitive Advantage | • Secrecy in findings in the way t claim patent rights<br>• Aiming to be Top Notch (Indi vidual or organizational)<br>• Not Incorporating Results |
| Organized Skepticism | **Strategic Task Uncertainty** | **Complying and Adhering** | **Dogmatism** |

| Science Logic (SL) | | Business Logic (BL) | |
|---|---|---|---|
| • Critical scrutiny of scientifi claims before being accepted t the body of knowledge.<br>• Empirical and Logical Criteria | • Consensus about main researc problems in field<br>• Hierarchy of problems | • Business Model<br>• Defined Strategy<br>• Defined Distribution<br>• Defined Product | • Fixed practices and values<br>• No Further Scientific Explanation |
| Disinterestedness | **Technical Uncertainty** | **Objectives** | **Interestedness** |
| • Benefits for common scientifi enterprise (collective gain)<br>• Less personal gain | • Stability of Problem Formula tions<br>• Hierarchy of Problems<br>• Research Techniques are clea for every academic. | • Benefits for individual (organ- ization) e.g., revenues and wealth. | • Personal (organizational) interests ar the major goals rather than collectiv gain. |

### 4.2.4. Coping mechanisms for addressing competing institutional logics

To understand the coping mechanisms towards competing institutional logics and the role of individuals in shaping and being shaped by the institutions, theories of human behaviour are needed (Thornton et al., 2012). They proposed that individuals may be situated, embedded, and boundedly intentional in certain institutional environments. The situated and embedded behaviours reflect on how individuals do their day-to-day work according to the 'template of action' (Oliver, 1991; Dunn and Jones, 2010) and bounded intentionality is defined as: 'individual intentions, guided by social identifications and individual interests and goals, are bounded by cognitive constraints on human behaviour' (Thornton et al., 2012, p.80). Friedland and Alford (1991) propose that there are two crucial views to show the relationship between individuals and institutional demands, namely 'opportunity' and 'constraint'. These views may create boundaries for how individuals to act and comply towards institutional pressure. Given this point, Thornton et al., (2012) argue that individuals may 'learn' and 'adapt' the new values and practices to 'embed' with the changes or to follow the new 'practices'. For instance, the existence of 'prominent exemplar' may shape or reshape the coping strategies of individual academics. Bercovitz and Feldman (2008) argue that individual academics who are trained in a department or school which are actively nurturing UBC are likely to engage themselves in such co-operation. The authors further found that if the chair of the department is actively (as a person) co-operating, it will result the members of the department emulate him/her to do so. Nonetheless, the study suggests that the engagement of academics by emulating the prominent exemplars is shown to be more symbolic than substantive as O'Reilly et al., (1991) argue that individuals comply to participate in UBC and have initiative simply to avoid sanctions.

Academics may refer to their dominant logic that determines their daily practices, for example, the logic that has originated from the profession and prior education (DiMaggio and Powell, 1983). D'Este and Patel (2011) show that academics are different in their motives and expectations when engaging in UBC. The study shows that academics

have been motivated to work with business by four factors: commercialization (commercial exploitation of research); learning (informing academics research via engagement); access to funding (combining public and industrial funds); and access to in-kind resources (industrial equipment, data and material). The study suggests that academics working with business in order to advance their own research rather than commercialize it shown by the lowest score of commercialization. Implied by this study, we highlight that participation of academics in UBC mostly driven by science logic suggesting the co-operation remained problematic via research commercialization.

### 4.2.5. Adherences and responses to science logic (dominant) and the business logic (new logic)

Academics may either remain embedded in their dominant logic (science logic) (Jain et al., 2009) or they may try to combine it with a new logic (business logic). Randall and Procter (2013) propose that when a particular logic compels its material practices, it may dominate and, later, expunge its rival logic. However, Christiansen and Lounsbury (2013) argue that the organizational actors can 'combine' elements of their dominant logic – i.e., social responsibility – with their less dominant logic – i.e., the business logic and that the combination may later provide space in reconstituting the organizational identity. Subsequently, the degree of adherence (acknowledgement) of academics who are embedded in science and business logics may vary depending on their 'knowledge' of the respective logics (Pache and Santos, 2013; Van der Sijde et al., 2014). To develop a complete schema of how academics have been situated and embedded in the dominant (science) logic and how they respond to a new logic (business), we adopt the model of coping strategies for competing institutional logics, proposed by Pache and Santos (2013) and approached by Murray (2010), which show the adherences, responses, and roles of the individuals. We adopt Lam's (2011) approach on academic entrepreneurship to group the identity of academics to participate in a type of UBC (research commercialization).

McPherson and Sauder (2013) propose that individual actors might "use" their dominant logic as tools to resolve conflict. These authors highlight that there is a degree of discretion of which logics are taken, which we might interpret this as degrees of coping strategies. Given this point, Pache and Santos (2013) propose stages of individuals' embeddedness either in the constraint of their dominant or in a new given logic, as stages of *adherence*. The stages are novice, familiar, or identified in a given logic. In UBC, 'novice' academics refer to persons who have limited knowledge in both science and business logic, for example, young academics who are pursuing a PhD (Roach and Sauermann, 2010), who have recently graduated and have just started working in academia without any experience in the business world. The 'familiar' adherence to science logic refers to persons in a mid-level career as an academic, and in business logic, it refers to academics who have gained experience in the project roles held in the business world. The 'identified' adherence to science is reflected by the behaviour of highly experienced persons in universities, i.e., professors, senior lecturers or senior researchers. Persons who are 'identified' with business logic correspond to persons who have full knowledge of business, shown by years of experiences working with business. Subsequently, Pache and Santos (2013) proposed responses of individuals for these adherences, including ignorance, compliance, defiance, compartmentalization, and combination. Applying these responses to an academic who addresses the business world, we encounter similar situations, for example, when an academic has no response to business logic, in accordance with the adherences to science logic; the academic ignores (ignorance), complies with (compliance) or defies (defiance) that logic. Furthermore, an academic with a number of years of experience in academia and business compartmentalizes (compartmentalization) the logics, whereas the highly experienced academic in both logics (tries to) combines the logics.

### 4.2.6. Academics' roles and groups toward competing logics

Adopting the Pache and Santos (2013) proportions, we propose that in UBC, academics may play a role as 'novice' academics, which refers to persons who are new in the world of science and in business indicating that they simply ignore both logics. However, this stage is short lived because these academics can quickly 'learn' and 'adapt' from other organizational members (Thornton et al., 2012; Pache and Santos, 2013). When an academic is a novice with business logic but is familiar with science logic, suggesting the academics may ignore the business logic but comply with the science logic, the academic's role is likely to be a 'follower'. In other words, the academic has no knowledge about business and dedicates no action to establish university–business cooperation. Furthermore, academics identified in science logic are likely to act as 'protectors', suggesting that science logic is the dominant logic, thus showing that the academic also takes no action to cooperate with business. When an academic is familiar with science and business logic because both logics are comparable, he or she is likely to compartmentalize the logics and act as an 'intermediary', suggesting that the academics are able to 'bridge' between the two logics (Bjerregaard, 2010; van der Sijde et al., 2014). Academics familiar with business logic and identified with science logic are likely to play a role as 'integrator'. This role show that academics can increase the coalition between business and science logics or that they may 'push' in practicing the norms and values of science logic with business logic. When an academic is identified with business logic and familiar with science logic, the academic role is likely to be an 'advocator'. These attributes suggest that the academic is not threatened by science logic but maintains the integrity of business logic to avoid losing her identity. Finally, when an academic is identified with both logics, she is likely to act as a 'hybridizer' or 'hybrid', suggesting that she can combine both logics.

In our study, we explore the variations with regard to hybrids as formulated in the literature. Pache and Santos (2013, p. 26) describe hybridizers as "individuals who are able to change the current institutional order to craft new sustainable hybrid institutional arrangements". Other studies have attempted to define the term. Tuunainen (2005)

claimed that hybrid practices are the ways of academics who are able to bridge the basic and applied research as well as are the ones who can "fuse" the science practices into commercial development. Jain et al., (2009) argue that the hybrid identity appears from the ability of academics to bridge the two worlds by "delegating" and "buffering" the science into business practices. Murray (2010, p. 378) attempts to provide another interpretation of hybrids and describes that "hybrids can arise from and maintain distinction between two logics". This encompasses to three situations, (1) hybrids emerge from "hostile world" where one logic compels another; (2) hybrids emerge from blending mechanisms that reduce distinction between institutions; and (3) hybrids emerge from "coexisting world" showing combination of material and cultures. Moreover, Murray (2010, p.350) added even though the academic and commercial science is distinct but they are not "operate in isolation"; which leads that hybrids strategies sometimes are not clear. For example, Murray (2010) found that patents are indeed as the strategy of hybrids to resolve these contradictive boundaries. With respect to how hybrids resolve conflicts, McPherson and Sauder (2013) append that individual actors might "shift" and "use" certain logics to deal with institutional complexity. These authors suggest in the local context, individual actors might use the logic as tools to achieved individual and organizational objectives. However, academics remained stay in their dominant logics as (McPherson and Sauder, 2013, p. 23) suggests that "actors affiliated with a professional or organizational group will closely adhere to that group's primary logic". This shows while actors at the local level may practice logic as the tools, but in broader field, the boundary between the logics remains unclear and actors may filter the logics to comply with (Lee and Lounsbury, 2015). With all approaches mentioned above, we propose that in UBC hybrid academics are the ones who can handle with two logics, the dominant and new logic; in this case they can make an interface between science and business logic.

Understanding toward the forming of hybrids over two competing institutional logics is important because this will elaborate how academics cope with such complexity. In respond to Murray (2010) about the need of study which further investigating the dynamics of hybrid

formation and blending coexistence and distinction; and call from McPherson and Sauder (2013) about the need of study that examine how actors use and interpret the field logics; our study attempts to advance the knowledge regarding the degrees of coping strategies that lead to the stages of formation of such hybrids. Adopting the Pache and Santos (2013) proposition on the individual role in competing institutional logic, we purpose to give another interpretation that hybrids in UBC can be formed by an effort of individual academics to "combine" two distinct logics by playing roles as follower, integrator, advocator and intermediary. Lam (2010) approaches the coping mechanisms from the academics' entrepreneurship perspective. The author argues that academics will negotiate and make sense of their roles and identities and recognise the boundary of science and business logic. Hybrids academics are the 'active agents seeking to shape the boundary between science and business, and have developed different modes of engagement with the emerging knowledge regime' (Lam, 2010, p. 3). The study proposes that when academics are involved in UBC, and by combining with Pache and Santos propositions academics may have orientation as (a) Traditional – academics who adhere to the norms of science and make a clear boundary between fundamental and applied research; (b) Traditional Hybrids – academics who share the traditionalist view and are willing to implement research programs for industrial demands and emerging markets; (c) Entrepreneurial Hybrids – academics who can combine the entrepreneurial orientation with the values and norms of academic science; or (d) Entrepreneurial Academics – academics who see the boundary between university and industry as flexible and permeable and can bridge between the two worlds. The concepts given by Lam (2010) are useful to differentiate the identities of academics in UBC and to describe the role of academics towards business logic.

Further, Lam (2011) attempts to connect the academics' orientation with their personal motivational factors. The study highlights that the Traditional Academics (Pure Traditionalist) and Traditional Hybrids are those academics who make a distinct boundary between science and business logics and 'pursue success strictly in academic arena' (p. 1360). It suggests that academics mainly pursue personal prestige or 'ribbon'

(Lam, 2011). In the same line, Pache and Santos (2013) suggest this coping attitude as 'protector' indicating (individuals) academics in this orientation defy business logic and comply with science logic. Lam (2011) appends the Entrepreneurial Hybrid academics as the ones who recognise the boundary between these two institutional logics and assume UBC is important for scientific advancement. The desire of academics to engage in university at this group is majorly to gain more financial income to advance their scientific projects or 'gold' factor. Pache and Santos (2013) propose the group of this kind of academics may act an 'intermediary' who can balance the values of science and business. Last, academics who are Entrepreneurial are the ones who 'believe in the fundamental importance of science–business collaboration for knowledge application/exploitation' (Lam, 2011, p. 1360). This group of academics is motivated by knowledge/curiosity of industrial collaboration (Lam, 2011) or 'puzzle' and act as hybrids as the ones who can combine or blend the two logics (Murray, 2010; Lam, 2011; Pache and Santos, 2013). Figure 5 describes the proposed coping mechanisms/strategies of academics towards the business logic constructed by adapting Pache and Santos (2013), Lam (2010, 2011), Jain et al., (2009), Tuunainen (2005) and Murray (2010). However, we exclude the roles of academics when they are familiar and identified with business logic but novice in science logic, because according to Figure 5, they may be 'protectors' and 'followers'. We propose that that these circumstances are not applicable because these academics will not ignore the science logic. Thus, we argue that academics who are resistant to participate with business project may act as "traditional academics" who defy business logic and comply their science logic while the ones who participated in business project act as hybrids who compartmentalize and combine the two logics.

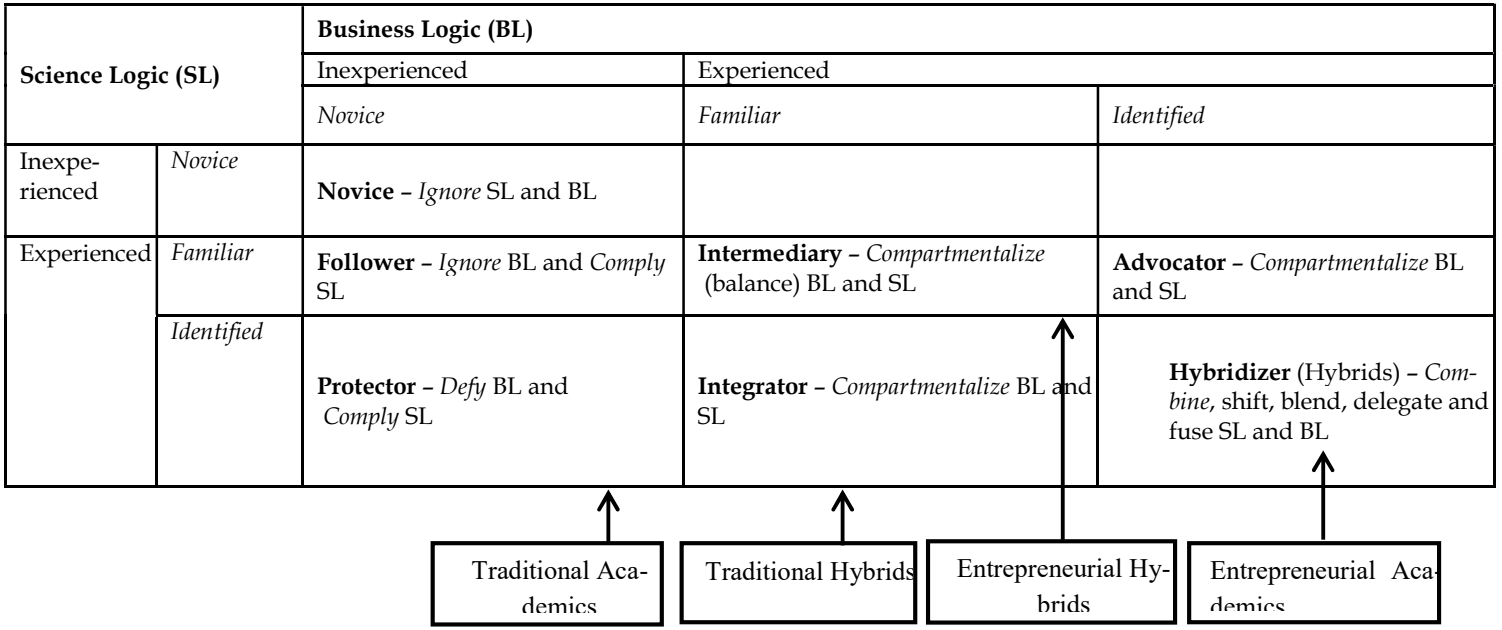



Figure 5: the coping mechanisms/strategies consisting of the adherence, responses and roles of academics for competing logics of science and business when exposing or participating in UBC, approached by Pache and Santos (2013); Lam (2010, 2011); Jain et al., (2009); Tuunainen (2005) and Murray (2010).

### 4.3. Research setting, data collection, and method

To explore the mechanisms through which academics cope with the world of business, we selected academics at two Indonesian universities. The reasons for selecting these institutions are as follows: First, all Indonesian universities have been adopting the 'third mission' or the Community Service Program (DGHE, 2003), since 1975. This mission, in addition to research and teaching, obliges academics and students to involve in the society and business community to increase the capabilities and competitiveness among small and medium-sized industries, entrepreneurs, farmers, and other societal groups. Nevertheless, academics can also engage with large and multinational enterprises and obtain 'credits', which is important in the pursuit of an academic career (DGHE, 2003). Second, the government of Indonesia through the Directorate General of Higher Education (DGHE) constantly offers funds for research collaboration via funds and programs under the Regional and National Innovation System (KIN, 2012). Thus, academics have an opportunity to collaborate with the business world via either their self-initiative and/or being facilitated by universities or government. Therefore, Indonesia provides us with an interesting context for studying the coping mechanisms of competing institutional logics in UBC. To explore a variation of a coping mechanism used by academics, two different types of public and private universities located in the same region in Indonesia were examined.

**Research site I:**We chose University A as research site I for the following reasons. The university is public and is among the oldest universities in Indonesia. Via its achievement in the three missions, the university has managed to obtain an "A" accreditation from the National Accreditation Board, together with 12 other leading universities in Indonesia (BAN-PT, 2014). The university is also denoted 'Autonomous' or 'Mandiri' in research, indicating that it can carry its own research agenda and manage government funds independently. Academics at this university have a high profile in research and publication, as shown by the high score in Scopus, which is equal to the other twelve Indonesian leading universities. In the valorisation activity, the univer-

sity has purposively increased its co-operation with stakeholders and industries using research clusters relevant to industrial and stakeholders' demands. For example, the university established research groups in Food Security, Pharmacy, Health, Disaster Management, Environment, Technology and Innovation and In Industry, Entrepreneurship, and Civil Society. Faculty members who are interested in applying for this UBC-type fund or the Research and Community Service Program can apply via the Lembaga Penelitian Pengabdian Masyarakat (LPPM) or the Unit for Research and Community Service. Moreover, academics in this university are civil servants; therefore, all files are under the governmental employee regulation (DGHE, 2003).

**Research site II:** We chose University B as site II to represent a private university and because it is one of the oldest technical universities in the region. Originated as an Advanced School (College) in Engineering, the university managed to become a "University" in 2002 after several reforms in the organizational structure and statutes. Unlike University A, University B focuses on technical research and teaching. University B serves research activities in Renewable Energy, Power Systems, Transportation, Informatics, Civil Engineering, and Survey Engineering. In research valorisation, in addition to LPPM, the university created a special unit named Badan Aplikasi dan Penerapan Riset (BAPR), or The Unit of Research Application and Implementation. Its task is to support valorisation of academic research and to commercialize it. Academics in this university have a status as the 'Yayasan', or Foundation employees with all aspects concerning their duties aligned with the university rules and obligations.

We selected fifteen academics at University A and fifteen Academics at University B from the departments of Electrical Engineering (EE) and Computer Science (CS) (in this study, the Informatics Engineering/Information System). The reason for choosing academics in these fields is that both EE and CS have the same root (Denning, 2000, 2005) and have a long history in UBC (Noble, 1977). However, although both are included as professional adhocracy and close-related disciplines (Whitley, 2000; Denning, 2005), the disciplines differ in the achievements of academics in these fields in UBC, as shown. For exam-

ple, Bozeman and Gaughan (2007) show that academics in engineering (including electrical, mechanical, chemical, and civil) have a higher degree of involvement in UBC than do academics in computer science with respect to higher grants and the clearness of the contract. Accordingly, D'Este and Patel (2007) show that academics in the field of electrical and electronics engineering tend to involve more UBC in form of meetings, consultancy, joint research, training, and the creation of physical facilities than do the academics in computer science.

Furthermore, in the Indonesia context, the EE field has produced 264 published documents and the Computer Science field has produced 239 published documents (SCImago, 2007). Nine academics at University A and 13 academics at University B participated, whereas the rest were unable to participate. We conducted face-to-face semi-structured interviews with 15 academics, videoconferences with 2 academics, and interviews by email with 5 academics, all in the Indonesian language (See Table 8). Each interview (excluding email-interviews) lasted between 30 – 40 minutes. The face-to-face and videoconference interviews were transcribed verbatim, and all interviews were analysed using qualitative software tool ATLAS Ti. We categorized the academics into two main groups, Experienced and Inexperienced. Experienced academics are the persons who have been involved in UBC-type projects more than the Inexperienced ones. This includes engagement in a variety of modes such as consultancy, industrial employment, commissioning, technology development, community service program and implementation. The Inexperienced academics correspond to persons who have been engaged at most in a small-scale Community Service Program and who conducted it at most one time in an academic semester. Both groups consist of mixing of early career researchers as well as established academic researchers. In the interview protocol, in science logic, we used the Mertonian norms as operationalized by Whitley: dependency (strategic and functional) and task uncertainty (strategic and technical) – (see Table 7), and competitiveness, objectives, disclosure and complying with business practices to operationalize to business logic, as defined by Mittroff (1974). Table 8 shows the respondents' distribution and experiences in business logic.

Table 8: Distribution and profile of the interviewees

| **Departments** | **Respondents' experiences with business logic** | **SITE I (Univ.A)** | **SITE II (Univ.B)** | **Total** |
|---|---|---|---|---|
| Electrical Engineering | Experienced | 4 | 4 | 8 |
| | Inexperienced | 3 | 4 | 7 |
| Computer Science | Experienced | 1 | 2 | 3 |
| | Inexperienced | 1 | 3 | 4 |
| | Total | 9 | 13 | 22 |

This study followed Eisenhardt (1989) on building a proposition from case studies. One of the main biases in a case study is the lack of generalizability. However, this study aimed to understand the coping mechanisms adopted by individual academics that may be applied generally (as suggested by Hartley, 1994), even from a single case of universities (as suggested by Gummenson, 2000). We prepared an interview protocol that consisted of topics on science and business logic. First, in science logic, we operationalized the concept of strategic and functional dependences and the concept of strategic task and technical uncertainty (see in Table 7). Furthermore, we determined subtopics that constructed the mentioned topics. For example, in strategic dependence, we constructed questions that related to how academics must persuade their colleagues and peers in research and publication, namely Persuading, Strategies, Convincing, and Collective Goal. In strategic uncertainty, we constructed questions that correspond to the stability of problem formulations and hierarchies of research problems. The main questions related to how academics define their research problem or whether they were working on the same set of problems.

Second, we constructed questions for business logic. The questions included how academics incorporate their research and business interests, whether they acknowledge the practices and the norms of the business world, and what drives academics to undertake research col-

laboration with industries – these questions provide information about the academics' knowledge of business logic. Finally, in the university valorisation activity, we prepared questions inquiring into three main topics, namely education, research and the third mission (i.e., the Community Service Program). For example, we formulated questions concerning the type of their university and whether experiences with businesses influence academics in preparing teaching materials for the classroom. We also asked questions that related to the third task, such as how the academics find ideas and topics, for example, their third-task projects, and what is the outcome of the third task performed by the academics.

## 4.4. Results

### 4.4.1. Coping strategies: compliance to dominant logic (science logic) and the inclusion of new logic (business logic)

This section presents results on the relationship between the adherences and responses of academics to the science logic in the department of electrical engineering and computer science. Following the Whitley's values (2000), our results suggest that the work organization of proposed fields corresponds to a low degree in strategic dependency. In other words, in conducting research, academics in these fields have a variety of goals. Concerning the collective goals, both inexperienced and experienced academics in science logic at both universities agree that they have no consensus about a greater degree of collective research topics, suggesting that the research problems have no hierarchies. Nevertheless, a lower degree of collective goals has been shown by academics in both fields. For example, an experienced (familiar) academic in science logic and an experienced (identified) academic in business logic at the department of electrical engineering of University A argue that the collective goal of his research refers to the group's goals or is of even smaller scope. He shows his compliance to this norm as follows:

"I comply with collective goals and do research on topics that related to such collective goals. The collective goals are determined by our research institutions and groups at our department in which the department sets a research agenda guided by the Long-Term National Research. Our department ratifies the agenda."

In recognizing the fields' elites or the clear elites, both inexperienced and experienced academics in science at both universities and departments argue that there are no clear elites existing for their research. All academics agree that peers from their departments, faculties, and governmental agencies are the elites of their research, but no particular elites in a broader scope were mentioned. The 'local' elites are the peers for research, for example, peers in the national research grants and publications. However, because EE and CS are fields that have a nature as a professional adhocracy, suggesting research in these fields are mostly applied and contextual (Whitley, 2000; Denning, 2005), there is an open "space" for the academics in these fields to be recognized by 'peers' outside their university. An experienced (familiar) academic in science logic and an experienced (familiar) academic in business logic at the department of electrical engineering at University B states,

"For example, the department assigns me to conduct this course even [though] other colleagues are also competent. Further, the department allows me to give lecture[s] in Power System[s] because of my experiences in industry. If we have reputation as a "professional", they (business professionals) will call us to solve their problem. They (business professionals) thought that we (academicians) are experts in their field, but instead, I gained the expertise from them."

The next variable in the strategic dependency is the core journal. Whitley (2000) proposed that in these fields, there were no core journals; thus, there existed no main universal research topics or consensus. Most interviewees agreed with this assessment, in which they mentioned many types of journals and did not point to a specific journal. This view is also aligned with the recognition of peers, in which academics recognize their peers but in small scopes, which implicitly shows their adherence to the field identity. An experienced (identified) academic in science logic and an experienced (familiar) academic in business logic in

the department of computer science at University B did not point to particular journals and stated,

"That will be the target of our colleagues (prof), in pursuing a PhD; for example, we pursue (to publish) in a well-reputation journal. So, we choose journals which are relevant to our research."

The last variable in the strategic dependency is the Strategies or the Research Agenda and Setting that relate to how the research agenda or research setting has been prepared to reach the main goals of the research. Because there is no consensus about the common goals of research, the perception of academics towards the research agenda is varied. From all interviewees, we found that research agendas were highly referred to by the National Research Grants offered by the Directorate General of Higher Education of Indonesia and to the individual research roadmap. This framework is widely adopted by universities. However, inexperienced and experienced academics in the science logic have a different perception of whether research can be related to industrial needs or are only for scientific purposes. An experienced (familiar) academic in science and experienced (identified) academic in business logic at the department of electrical engineering of University A tend to compartmentalize the logic of science and business because he argues,

"My research is often based on the industrial needs. I (often) do research outside the university (topic) and let the industries select them."

Accordingly, an academic who is experienced (familiar) in science logic and experienced (identified) with business logic at the department of computer science of University A shows the agreement with his colleagues from the department of electrical engineering. He says,

"We can use (cooperation) for our research topic, and I will involve students in this."

However, inexperienced academics in business logic at the department of electrical engineering at University A and at University B have a dif-

ferent perception about the research agenda. They seemingly do not consider possible industrial applications of their research, and they show a tendency to follow the research agenda as it is formulated. An experienced (familiar) academic in science logic at University A shows his ignorance of business logic and his compliance with the science logic:

"All research topics have been prepared by our institutions, and my research has been selected by the national department (government agency)."

In addition, an experienced (familiar) academic in science logic and inexperienced (novice) academic in business logic of University B implicitly ignores the business logic and complies with the science logic because she argues,

"My research has been reviewed by three (university) examiners who are experts in the research topic."

Whitley (2000) proposes that academics in the fields of EE and CS are high in functional dependence. In other words, academics in these fields shared standardized procedures and methods of research. All interviewees have a common perception that research methods and procedures are standardized and cleared for everyone in the groups. They also provide a hint that sharing ideas with colleagues and the influence of colleagues' works on their work are more of local rather than wide scope. However, academics who inexperienced and experienced in business logic have a different opinion about working in multidisciplinary fields. An experienced (familiar) academic in science logic and experienced (identified) in business logic at the department of electrical engineering at University A states,

"It depends on the research and work we handle. In general, I am working on interdisciplinary research. However, there are several small pieces of research that [are] based on the individual and in the same fields."

An inexperienced (novice) academic in business logic who is familiar with science logic at University A at the department of electrical engineering suggests a different opinion; he states,

"I am working with teams consisting of students and in the same field."

In Task Uncertainty, we show how academics comply with the strategic task and technical uncertainty. Whitley (2000) argues that the fields of engineering and computer sciences are the fields that have a low degree of strategic task and technical uncertainty. In other words, academics in these fields address predictable research results and stability of problems. All respondents agreed that they have no difficulties in finding research topics and problems because the fields provide the flexibility to let the academics choose a greater variation of research topics. Furthermore, all academics suggest that they have a standardized method to conduct research. To summarize, we present Table 9 to describe the adherence of academics to the science logic in their field. Table 9 suggests that there is no difference in adherence to science logic between the universities and fields. This situation is also consistent with Whitley's values about field characteristics of strategic and functional dependency. However, we see the differences between experienced and inexperienced academics concerning the perception about the need for another "space" for a particular logic to exist. In Table 15, the experienced academics agree with the Whitley's value of the fields shown by their acknowledgement that their research cannot directly be related to business, but they can work in multidisciplinary environments. For example, an experienced academic at the department of computer science at University B argues that he cannot combine the science and business logic, but he can compartmentalize it because he suggests,

"So, the problem is that a misunderstanding of concept of (research) in information system as we (academic) perceived to what they (professional) perceived. They (business) cannot combine the scientific concept to what they need in practice. That is the big issue. When we propose open the idea of our research, they just say, 'please just do it'."

In line with this observation, an inexperienced (novice) academic in business logic who is experienced (familiar) in science logic at the department of computer science at University B suggests that he ignores the business logic and complies with the science logic:

"It is fundamental (research) and it is aligned with our university's agenda. The course for students consists of theory and application. I think my research should be fundamental, but in the end, it should be applied to business, but first I prefer to conduct the fundamental ones."

To conclude, the experienced academics in business are trying to compartmentalize the science and the business logic. Conversely, inexperienced academics in business are either ignoring or defying the logic of business. However, both academics are fully complying with their dominant logic, the science logic. Table 9 shows the propensity (the number of academics) of experienced and inexperienced academics in business logics to adhere to the science logic. Table 9 shows that there are no discrepancies in adherence to the science logic at either university or in either field; however, the experienced academics in business tend not to relate their research to business. Rather, they show a tendency to work in multidisciplinary research.

Table 9: The compliance of academics to science (field) logic and inclusion of business logic

| **Science Logic (SL)** | **Whitley's values for CS and EE** | **Computer Science (CS)** | | | | **Electrical Engineering (EE)** | | | |
|---|---|---|---|---|---|---|---|---|---|
| | | **Univ. A** | | **Univ. B** | | **Univ. A** | | **Univ. B** | |
| | | **E = 1** | **I = 1** | **E = 2** | **I = 3** | **E = 3** | **I = 4** | **E = 4** | **I = 4** |
| **Strategic Dependency** | | | | | | | | | |
| • Collective Goals | No | (1) * | (1) | (1) | (3) | (3) | (2) | (1) | (2) |
| • Clear Elite | No | (1) | (1) | (2) | (3) | (3) | (3) | (4) | (2) |
| • Recognition from peers only | No | (1) | (1) | (1) | (3) | (3) | (3) | (4) | (2) |
| • Core Journals | No, depends on journals scope | (1) | (1) | (1) | (2) | (3) | (3) | (4) | (2) |
| • Field Identity | recognizing peers | (1) | (1) | (1) | (2) | (3) | (3) | (4) | (2) |
| • Strategies/ Research Agenda setting | | | | | | | | | |
| ○ Can be related to business | Yes | (0) | (1) | (0) | (3) | (0) | (1) | (0) | (2) |
| ○ Can be related to national policies | Yes | (1) | (1) | (1) | (3) | (3) | (3) | (1) | (3) |
| **Functional Dependency** | | | | | | | | | |
| • Standard methods and procedures | Yes | (1) | (1) | (2) | (3) | (2) | (4) | (2) | (3) |
| • Sharing ideas with colleagues | Local more than global | (1) | (1) | (1) | (2) | (2) | (3) | (3) | (2) |
| • Influences of colleague (s) work to the individual work | Local more than global | (0) | (1) | (1) | (2) | (2) | (3) | (3) | (2) |
| • Dependencies on other field | Yes | (1) | (0) | (2) | (0) | (2) | (0) | (3) | (0) |

| | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|
| (s) | | | | | | | | | |
| **Strategic Task Uncertainty** | | | | | | | | | |
| • Consensus about main research problems in field. | No | (1) | (1) | (2) | (2) | (2) | (2) | (4) | (2) |
| • Hierarchy of problems. | No (individually drive problems) | (1) | (1) | (1) | (2) | (3) | (3) | (3) | (2) |
| **Technical Uncertainty** | | | | | | | | | |
| • Established Research Techniques | Yes | (1) | (1) | (2) | (3) | (3) | (3) | (3) | (3) |
| • Research Techniques is Predictable | Yes | (1) | (1) | (2) | (3) | (3) | (3) | (3) | (3) |

E = Experienced with Business, I = Inexperienced with business, *the number of academics who suggest the value, which not interpreted as quantitative amount.

### 4.4.2. Coping strategies: comply to business logic and inclusion of dominant (science) logic

This section presents how those inexperienced (novice) and experienced (familiar and identified) in business adhere to business logic. An inexperienced (novice) academic in business logic and experienced (familiar) in science logic at the department of electrical engineering at University A explicitly defies the logic of business; he argues that the business logic leads to a contradiction of his approach to research and teaching. He argues that his field is too far from application in industries, and although he applies his research to business, it does not benefit his academic reputation. He states,

"What I have been researching recently will be useless (for business), but for the scientific contribution it will be OK. If we seek to implement (my research) in the business world, it will be difficult because (in the industries) they work with just a simple theory, such as the Proportional Integrative Derivate (PID). Simple problems (in business) can be solved. In the real world (business), it is not so sophisticated. When we talk about theory, we talk about mathematics."

Less experience in collaboration with business hinders academics in obtaining knowledge about business logic, which is shown by the lack of knowledge on competitiveness and the working habits of business. An inexperienced (novice) academic in business logic and experienced (familiar) in science logic from the department of electrical engineering in University B states an opinion about the difficulty in establishing collaboration with the industries is when to start a collaboration. Moreover, inexperienced academics may "learn" from experienced academics like experienced colleagues. Unlike the inexperienced academic in University A, he is not necessarily defying the business logic; rather, he is ignoring such logic. He argues,

"I never got fully in touch with business; UBC may be difficult. Because I've never tried it, I teach full time, unlike my colleagues who once have tried work-

ing with business and then they get used to it. If I know how to get in (with business) then I can continue the cooperation."

In the department of computer science, an inexperienced academic in business logic and experienced (identified) with science logic at University A describes his objection to being involved with business as a consultant. Accordingly, he defies coping with such a condition; as Mittroff (1974) did, he proposed that Particularism corresponds to a situation in which academics must cope with a given situation rather than leading or organizing. Although it may benefit him, he seemingly defies being involved in business because:

"I would be losing much. First, I would be wasting my time; second, I would earn less economic compensation. So being a consultant (in company) is an inconvenient task for me. I would need to spend a lot of time there."

This statement is also aligned with the opinion of an inexperienced academic in business logic and experienced (familiar) in science logic at University B. She agrees that academics should be involved in the valorisation activities, but she implicitly argues that valorisation may take away academics from their obligatory duties, such as teaching. Although she is not complying with the logic of business, she acknowledged that being involved in business is important. Concerning the Mittroff framework, the inexperienced academic acknowledges her personal interests and her own objectives as an academic. In this context, we label this academic as the person who complies with the science logic and ignores the business logic. She states,

"It is necessary (for business), for self-development as an academic and we can promote our university. For example, when we engage with business as a trainer, then people will know our university, and as person, people will know who we are [ ]. However, there is a negative effect: academics who often [are] involved with business will leave their obligatory duties, such as teaching because they spend more times outside the university."

For experienced academics both in science and business logic, collaboration with business has become interplay between the science and busi-

ness practices. The most common cases are the difficulties with linking the interests between the practices of science and the practices of business. The difficulty with integrating Organized Scepticism and Dogmatism is an example. An experienced (identified) academic in science logic and experienced (familiar) in business logic at the department of electrical engineering in University A argues that, although it is difficult to combine the fundamental and industrial research, he can compartmentalize the need of industries apart from his research roadmap. Based on his experiences, he argues,

"I can incorporate the need of industries (with my research) by making identification of the industrial problems. For example, if there is a problem with equipment/sensors in the industry reported by my students. The equipment could be one of my next studies. If possible, we can communicate to that industry in case the research is good."

He continues,

"However, it is difficult to combine the fundamental and industrial research. Fundamental research uses material and equipment on a lab scale, which is (in quality and quantity) different from the ones in industrial demands."

The compartmentalization between science and business logic does not always occur for experienced academics in business logic. In Dogmatism, an experienced (identified) academic in business logic and experienced (familiar) in science logic in the electrical engineering department at university B argues that he must follow a business goal. Otherwise industries can terminate the collaboration. He states the following arguments:

"There is a conflict between the scientific standard (of research) and the business standard of research and problem solving. Regardless, we must follow what they (business) need for us to do."

He continues,

"We followed them. If we push our academic standard clearly, we are not following them. We must keep pace with their Standard Operating Procedure (SOP). This is different from our own SOP (academic). It may lead to conflict. At the end, we have a lack of quality. On the one hand, we need research funds from them, and on the other hand, we must lower our academic idealism."

Next, experienced academics in the computer science departments have similar thoughts about coping with competing logics in UBC. Adaptation with business procedures and working habits are the coping mechanisms to face the Dogmatism of the industries. An experienced academic at the department of computer science from University A suggests the importance of adaptation with business. We group this academic as one capable at combining business and science logics. He states,

"If we can adapt with them (business), it will make (collaboration) easier. First, do not use scientific terms, and if they (business) refuse that, do not insist. If they (business) are comfortable with us, all collaboration problems can be solved."

Another experienced (familiar and identified) academic in business logic in the computer science department at University B argues that projects that have been conducted in collaboration between universities and business often suffer from a lack of commitment from business professionals. He also argued that UBC always occurred in unmatched conception but is easy in communication. We group this academic with persons who can compartmentalize the logics. His opinion is,

"The main problem is in the understanding in concept, an information system from the academics side with (maybe) less experience in the practical sides. They (business) are not able to combine concept in the academic way with what they need in the field/practice. That's the major problem."

To summarize, the compliance to business logic has been shown by the degree of experiences in business or industries and does not depend on the degree of experience in science logic. Table 10 describes points of the propensity of inexperienced and experienced academics working with

the industries coping with business logic. Table 10 shows that the universities' type and disciplines are not influenced by the academics' knowledge of business logics but by experiences.

Table 10: compliance of inexperienced and experienced academics to business logic

| **Business Logic (BL)** | **Computer Science** | | | | **Electrical Engineering** | | | |
|---|---|---|---|---|---|---|---|---|
| | Univ. A | | Univ. B | | Univ. A | | Univ. B | |
| | E = 1 | I = 1 | E = 2 | I = 3 | E = 3 | I = 4 | E = 4 | I = 4 |
| Competitiveness | | | | | | | | |
| • Better than competitor | (1) * | (0) | (1) | (1) | (1) | (0) | (4) | (0) |
| Disclosure<br>• Close disclosure of research results | (0) | (0) | (0) | (0) | (0) | (0) | (1) | (0) |
| Complying and Adhering to | | | | | | | | |
| • Business Model | (1) | (0) | (1) | (1) | (2) | (0) | (3) | (0) |
| • Defined Strategy | (1) | (0) | (1) | (0) | (2) | (0) | (2) | (0) |
| • Defined Distribution | (1) | (0) | (1) | (0) | (1) | (0) | (3) | (0) |
| • Defined Product | (1) | (0) | (2) | (0) | (3) | (0) | (4) | (0) |
| Objectives | | | | | | | | |
| • Benefits for Individual | (1) | (0) | (2) | (0) | (1) | (0) | (4) | (0) |

E = Experienced with Business; I = Inexperienced with Business, *the number of academics who suggest the value which not interpreted as quantitative amount.

### 4.4.3. Coping strategies: roles and groups of academics– compliance (comply science and defy business logic) and compartmentalization (intermediary both logics)

From 22 academics, we group them into the roles of the individual action in UBC. For inexperienced academics in business, we confirmed that there are 9 academics and another 13 experienced academics (agreed with Table 8). The novice academics in both logics are individuals who see that they are in the early phase of their academic careers and have not even started to do the community service program. However, this situation is limited to academics who have never worked in business before joining as an academic. Our finding suggests that the Pache and Santos framework fits this situation. Along with the rise of their academic career, academics who are novices in business logics begin to be followers and protectors. However, they participation in UBC may be symbolic rather than substantive (Bercovitz and Feldman, 2008). We interviewed eight inexperienced (in business logic) academics who act as followers. For example, an inexperienced (novice) academic in business logic who was familiar with science logic stated,

"I think to cooperate with business would be difficult because I have never been tried it before, but if I see my friends who tried it once, then they continued to do it because they know how to do it."

Furthermore, we found only one respondent acting as a protector, suggesting that he defies the business logic and complies with science logic. This person is identified with science logic and as a novice with business logic. He argues,

"To be a consultant would be difficult; we have to spend more time there (in industries). That is problematic. However, to be a consultant, we are not obliged to be there (at industries). We stay here (in university) and focus on my task here (in university). If they want (business), we can leave for a while."

Our results suggest that most experienced (familiar) academics in business logic are more likely to compartmentalize the logic and act as in-

termediary, integrator and advocator. We did not find any experienced (who both identified with science and business logic) academics who act as a hybridizer. Reasons for the situation are generated because no academics own (a) company. Furthermore, at the public university, it is prohibited to have a company due to the civil servant laws. Next, we found three respondents who are familiar with both logics, suggesting that they can compartmentalize the science and business logics and act as an intermediary, showing that these academics can bridge the practices between two logics. For example, an academic in the computer science department at University A states,

"To work with the business is easy, if we can adapt (with them). First, we do not focus on the use of scientific terms and don't be too straightforward or refuse them directly. If they are comfortable with us, however, we can solve the problems. We do not have to be aggressive frontal even though we have a PhD in this field."

Subsequently, we found three respondents who act as an integrator, suggesting these academics may 'push' and integrate the practice of science and business logic. An experienced (identified) academic who holds a PhD with some years in academia tends to this role. For example, an academic in the electrical engineering department in University A suggests,

"To work with business, I have research on the Micro-Hydro (MH) controller. Last year, I tried it once, which was difficult. The turbines and the generator are easy, and the MH is the domain of the developed countries. I want to develop this, but I faced obstacles. Although I got a grant from the government, I do not know how to sell this to business society."

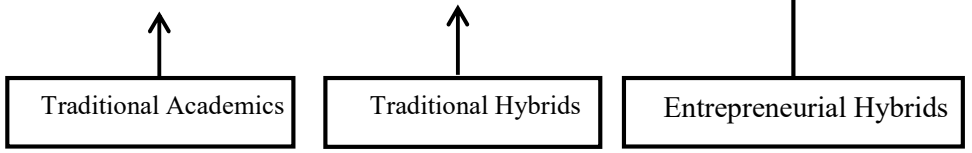
However, the integrator academics determine their roles in UBC either as a leader or as a researcher in research implementation. As a "leader", academics will lead or push their research or as integrator to initiate UBC, whereas as a "researcher", academics will be members of projects. This strategy is consistent with when academics act as an advocator, when they use their knowledge in business logic to advance science and

to keep their identity in science logic. As an advocator, an experienced (identified) academic in business logic and experienced (familiar in business) at the department of computer science in University B argues,

"Just like in Information Systems in our university, if we analyse the implementation of a system, we must know the role of business. The business logic of this is, for example, if students want to take courses, they should register online. We cannot interfere with the users in our university so I highlight this as high technology, but it has a low impact on our organization."

To conclude, based on their adherences and responses, we group them into their roles concerning the business logic, and we group them in the degree of entrepreneurial action of the academics. Figure 2 describes the roles of academics.

| **Science Logic (SL)** | | **Business Logic (BL)** | | |
|---|---|---|---|---|
| | | **Inexperienced** | **Experienced** | |
| | | *Novice* | *Familiar* | *Identified* |
| **Inexperienced** | *Novice* | **Novice –** Ignore SL and BL, n* = 2 | | |
| **Experienced** | *Familiar* | **Follower –** Ignore BL and *Comply* SL, n = 6 | **Intermediary –** *Compartmentalize* (Balance) BL and SL, n = 5 | **Advocator –** *Compartmentalize* BL and SL, n = 5 |
| | *Identified* | **Protector –** Defy BL and *Comply* SL, n = 1 | **Integrator –** *Compartmentalize* BL and SL, n = 3 | |




*the number of academics who showed the values; which not interpreted as quantitative amount
Figure 6 : the coping mechanisms/strategies consisting of the roles and groups of academics in UBC

### 4.4.4. Interplay between the university's valorisation activities and the compliance to business logic

The interplay between the science and business logic has been shown in the previous sections. This section aims to show the interplay between business logic in university's activities, for example in teaching, research and community service, and differences between the two universities. In teaching, for example, experienced academics in business logic from the departments of computer science at both universities have different opinions. An experienced (familiar) academic in business logic and identified in science logic at the department of computer science at University A shows his concern about incorporating the business logic into teaching, as follows:

"I always (do) that thing, I do let students brainstorm for the course I'm responsible for; for example, in the Programming or in Control System course. I'll give a hint as to the use of the course in the market or in the world of work. And, I also give them such motivation and experiences."

A different idea is suggested by an experienced (familiar) academic in business logic and identified in science logic at the department of computer science at University B because he suggests,

"Since I have never taught that subject before, I do not want to incorporate (applied) (the collaboration) research into teaching. When you teach the bachelor/undergraduate level, you do not need to get the depth of science, except if you do a PhD. At the bachelor, you only need to teach very basic. For example, the Programming course is a pre-requisite of image processing."

In research, although electrical engineering and computer science are fields close to industries (Whitley, 2000), the inexperienced (novice) academics in business do the basic research as their research strategy. An inexperienced academic in business logic at the electrical engineering department from University A states,

"What I have studied/researched at the university is somehow 'useless' but for the contribution to the science is OK. We can do the complexity of math in our research, but if we want to implement those to practice it should be in a very simple way."

At Universities A and B, the experienced academics in the business logics of EE and CS indicate a preference that business logic would affect the nature of research. Experienced academics in business may augment the nature of research in their department because they have been exposed to 'commercial logic' for a long period, suggesting they have knowledge in how to address business. They have a compartmentalized thought that research should not only 'stay' at the university, but it must be practicable, implying that the commercialization of research has occurred (Shane, 2004). An experienced academic in business at the electrical engineering department at University A states,

"I have a research project that I think I can commercialize the product of. Fortunately, I got a grant from the government. I have a project in Micro Hydro Power Plant, which is designated to the rural areas. However, I wonder who will be the customer, since few of them were able to buy it."

The third dimension of university practices is the 'third mission', or Community Service. This mission is an obligatory task and has been done since the 1970s at Indonesian universities (DRCS, 2012). Academics should be involved in any UBC project through the third task 'credit' to complete the 'academic credits' (DGHE, 2003). Experienced and inexperienced academics in business logic have performed a variety of approaches to do the community service. The 'commercial logic' has affected the practice of community service (see Table 4). Academics at University B have performed community service on an individual basis, while academics at University A have mostly been appointed by the university. An experienced academic in business logic at the department of informatics of University A who has been assigned to a UBC project expressed that this project is not fully useful to improve his reputation. In addition, he then said that the project is only a minor

credit in community service and therefore does not affect much. He says,

"That (the community service) is regarded as the UBC project. I work there because I've been assigned by the university. I never do a UBC with the university's grant; rather I prefer to get funding from outside (business)."

This statement is also aligned with an experienced academic in business logic in the department of electrical engineering of University B because he says,

"By being involved in UBC, I am more exposed to society. It is making me know them better, and at least they (society) have a sort of dependency on our university by letting us solve their (technical) problem. Then, we can engage their local authority, since we are not able to 'change' them."

To conclude, there are a variety of coping mechanisms to incorporate the business and the university activities. Table 11 shows all the propensity of academics' adherence to business logic related to university activity. The table shows that experienced academics in business try to incorporate the logic of business into university activities such as teaching and community service. Table 11 also suggests that UBC at both universities is different in terms of Community Service; UBC is personally driven at University B, whereas at University A, participation in UBC is mostly assigned by the university.

Table 11: the propensity of the effects of business logic on a university's valorisation activities

| **University's Activities** | **Computer Science** | | | | **Electrical Engineering** | | | |
|---|---|---|---|---|---|---|---|---|
| | Univ. A | | Univ. B | | Univ. A | | Univ. B | |
| | E = 1 | I = 1 | E = 2 | I = 3 | E = 4 | I = 3 | E = 4 | I = 4 |
| **Teaching** | | | | | | | | |
| Experiences with business are shared in the classroom | (1)* | (0) | (1) | (0) | (4) | (0) | (4) | (0) |
| **Research** | | | | | | | | |
| The nature of Research | | | | | | | | |
| • Applied | (1) | (1) | (2) | (3) | (4) | (0) | (4) | (0) |
| • Basic (Fundamental) | (1) | (1) | (0) | (3) | (0) | (3) | (0) | (3) |
| Research Outcomes | | | | | | | | |
| • Prototype/Product | (1) | (1) | (2) | (3) | (4) | (0) | (3) | (0) |
| • Report | (0) | (1) | (0) | (0) | (0) | (0) | (0) | (0) |
| • Papers/Articles | (1) | (1) | (2) | (0) | (4) | (3) | (4) | (3) |
| • Method (s)/Simulation | (0) | (0) | (0) | (3) | (4) | (3) | (0) | (3) |
| **The Third Task of University (e.g. Community Service)** | | | | | | | | |
| Ideas to do UBC | | | | | | | | |
| • Individually driven | (0) | (0) | (2) | (2) | (0) | (0) | (4) | (2) |
| • From Business | (1) | (0) | (2) | (0) | (2) | (0) | (3) | (0) |

| | | | | | | | | |
|---|---|---|---|---|---|---|---|---|
| • Assigned by the university | (1) | (1) | (2) | (3) | (4) | (3) | (4) | (4) |
| Audience of UBC and knowledge dissemination | | | | | | | | |
| • Business/Companies | (1) | (0) | (1) | (0) | (0) | (0) | (3) | (0) |
| • Government/Funding Agencies | (1) | (1) | (2) | (3) | (4) | (3) | (4) | (3) |
| • Society | (1) | (0) | (2) | (0) | (2) | (0) | (3) | (2) |
| Relationship with business via Community Service | | | | | | | | |
| • Maintaining relationship | (1) | (0) | (1) | (0) | (3) | (0) | (2) | (0) |
| • Improving over times | (0) | (0) | (1) | (0) | (0) | (0) | (2) | (0) |

E = Experienced with Business; I = Inexperienced with Business,

*the number of academics who suggest the value which not interpreted as quantitative amount.

## 5. Discussion and conclusion

The purpose of this study was to examine how individual academics cope with the divergent institutional practices of science and business in the UBC framework. By contrasting two groups of academics (experienced and inexperienced with business) at two universities (public and private universities) and two fields of sciences (Computer Science and Electrical Engineering), we studied the variation of individual academics' responses on competing institutional demands. With respect to the adherence to the science logic, there is no discrepancy in the practices and norms of science between the two universities, particularly in how science is interpreted (see Table 9). This shows academics at both universities and both fields are complying with the common values of electrical engineering and computer science education and research, which caused academics in these fields to comply with similar values and practices (Whitley, 2000; Denning, 2005). Academics with inexperience with business are labelled as "novice" with business logic. It was argued that their research can be encompassed into two trajectories. The first trajectory is one that can be related to the business demand and complies with the setting of the research agenda. Academics that are inexperienced with business logic in both fields perceive that their field is "close" to the world of business, suggesting that forming a relationship with business is easy and doable.

However, a different situation exists for academics that are experienced with business, as they are labelled as "familiar" or "identified" with business logic. Electrical engineering and computer science are considered to be professional adhocracies, suggesting that research conducted in these fields is contextual and application oriented (Whitley, 2000; Denning, 2005). Experienced academics argue that involving themselves in UBC is difficult and challenging. Unlike academics that are inexperienced in business logic who perceive their field as "close" to the world of business, a perception not shared by experienced academic, they argue that working with business professionals is problematic. Table 9 shows a discrepancy between experienced and inexpe-

rienced academics regarding the dependencies of their fields on other fields. Experienced academics agree that their field depends upon other fields and they can work in multidisciplinary environments, whereas inexperienced academics are more likely to argue that the fields are "standalone". While experienced academics perceive the presence of other fields in their research in a "Mode 2" research orientation (Nowotny et al., 2003), inexperienced academics prefer 'Mode 1' of knowledge production and independence from other fields.

To summarise, these findings suggest two dimensions. First, regarding Whitley's proposition about the nature of a field, our results indicate that, although the field of computer science and electrical engineering can be "applied" and contextual in its nature, it is not necessarily driving academics to work with the business world. In other words, even when there is leeway in a field, UBC is still problematic. Second, our results highlight an interesting point about how a "hybrid" academic copes with two competing logics. This supports the study of Murray (2010, p.378) who argued that "hybrids can arise from and maintain distinction between two logics". This suggests that experienced academics are able to maintain a distinction between the two logics during their engagement in UBC. However, our results are not fully in line with Pache and Santos's (2013, p.26) proposition who argue that "hybrids are individuals who are able to change the current institutional order to craft new sustainable hybrid institutional arrangements". This suggests we could not find academics who are fully able combining the two worlds, as described in Figure 9.

Interesting results come from the adherence of academic to business logic where we highlight that a similar situation has occurred. Inexperienced and experienced academics use different coping mechanisms for business logic. Although this situation implies that both groups of academics have 'knowledge' of what will happen if they incorporate research, for example the basic versus applied research, Table 9 suggests that there was no experienced academics in our interviews. This suggested that their field was an open space for business work. As mentioned earlier, inexperienced academics argue that working with business is easy and doable, but inexperienced academics tended to

defy business logic because they presume it will not fit with their daily practices or template of action (Oliver, 1991; Dunn and Jones; 2010). This situation describes the condition where academics, either experienced or inexperienced with business, may subconsciously "separate" the boundary between the two worlds, although they may embed themselves in the new material, practices, and values via participation in UBC (Pache and Santos, 2013).

In the interplay between university strategy and business logic, our results suggest that experienced academics in business logic have attempted to "combine" the values and practices of business with the universities' practices, whereas inexperienced academics in business logic tend to stay within their scientific boundary. Research valorisation and commercialisation by a university have influenced the academics' behaviour in coping with the conflicting logic. For example, in the public university, ideas to provide Community Service are mostly derived from the business' and university's project, whereas in the private university, ideas for the community service program are often individually driven. This shows that "pressures" from universities is greatly associated with the degree of adherence of academics in UBC. Pache and Santos (2013) propose that the degree of compliance to a new given logic may operate in conscious and subconscious states. Academics experienced in business logic in the public university may consciously comply with business logic because they were assigned by the university. Conversely, experienced academics in the private university may subconsciously comply with the logic of business because they are largely involved in UBC individually.

This chapter, although it has limited empirical data, attempts to contribute to a number of academic disputes of the relationship between micro and macro action from the institutional logics perspective (Thornton et al., 2012). Our study aims to provide empirical evidence and advance our understanding about coping mechanisms and hybrid academics in UBC. Lam (2011) suggests hybrids are the ones who can "combine" the logics and the ones who can recognise the boundary between the two logics. Murray (2010) argues that hybrids emerge from a "hostile world" where, for example, business logic compels science logic

or vice versa. Hybrids emerge from the blending of the two. In our study, we highlight that hybrids or the forming of a hybrid can emerge from organisational coercion due to the obligation of Indonesian academics to engage with UBC (Swan et al., 2010). However, there were few academics that we categorised as a "hybridiser". This suggests that academics can fully combine both logics because none of the academics run a company or enterprise and none of them intend to incorporate their research into business demands. With regards to the coping mechanism, we provide the mechanisms of coping strategies for the context of UBC from the view of academics, meaning that there is a given dominant logic to which a second is added. We elaborated on how academics will respond when they are situated and embedded in situations with different institutional logics (Thornton et al., 2012) and how the responses may differ.

Our results show the identity and role of academics in two competing logics. Academics that are experienced in business logic play roles, such as the intermediary, integrator and advocator, and compartmentalise the practices of science and business when participating in UBC. Academics that are inexperienced in business log are categorised as the follower and protector of the science norms. Experienced and inexperienced academics, however, acknowledge the boundary between science and business. Our results suggest that the variations of coping mechanisms are not solely based on the interplay between the two logics, but also arise from the setting of the logic. We highlight that coping mechanisms are not only a simply of rational choices or dialectical processes, but it is attributed to how much experience and exposure academics have to the business logic.

The next contribution is that we provide empirical evidence and test the Pache and Santos predictions of how individuals cope with the competing institutional logics within an organisation. Pache and Santos (2013) do not include the dominant logic in their framework. However, we argue that the science logic is the dominant logic. In the result, we extend their proposition about individual characteristics to organisational practices, as suggested also by Thornton et al., (2012). The effect of business logic on both universities is different in terms of how the

university practices and believes the logic. University A has a legitimate means of establishing a UBC project with business by direct appointment of its academics. The tension has arisen because not all academics agree that UBC funded by the university is useful to increase the interaction with business people. Academics at University B are free to collaborate with business.

Our results suggest that academics can use one of several coping mechanisms when they face tension between science and business logic. We found evidence that traditional and entrepreneurial hybrids (Lam, 2010) emerge from academics who can compartmentalise these two logics as they play the roles as intermediary, integrator and advocator (Pache and Santos, 2013). However, we highlight that there is no real hybridiser (Pache and Santos, 2013) or entrepreneurial academic (Lam, 2010, 2011) who can fully combine or "blend" the two divergent logics of science and business. We highlight that hybrids are created according to the knowledge that academics favour a particular logic. For example, academics who are "familiar" with science logic and "identified" with business logic may act as an advocator. The results are in line with the approaches of the previous study of Murray (2010) and McPherson and Sauder (2013). While hybrids can "arise from and maintain distinction between two logics' (Murray, 2010, p. 378), we note that the hybrids may be separated into three polarities as our results suggested (see Figure 4). These polarities consist of hybrids who are "business oriented", "equal in business and science", or "more science-oriented". We notice that the "hybrids" encompass those who attempt to blend the two logics but keep compartmentalising them, suggesting the boundary between science and commercial science are clear and present (Bjerregaard, 2010, Murray, 2010). Next, our study reinforces the arguments proposed by McPherson and Sauder (2013) whereby logics are one of the tools targeting organisational objectives. Individual actors may shift, use and "hijack" such logics. We highlight that academics may "use" their (dominant) science logic and transform it into "business logic". Our study suggests individual academics compartmentalise the two logics, playing roles as integrator, intermediary and advocator.

We conclude that academics who are reluctant to participate in UBC may act as "traditional academics" that ignore or defy business logic and comply with their dominant (science) logic, while academics who are interested in participating may act as a "hybridiser", showing that they can compartmentalise between the two logics. However, one of the weaknesses of building such a proposition from a case study is the lack of generality (Eisenhardt, 1989). However, our study has mapped the attitudes of academics toward business logic that may be replicated in other research settings. Although Indonesian universities are moving towards becoming "hybrid organisations", the attitudes of academics vary greatly in regards to hybridity. Further study is needed to determine how a hybrid organisation is possible. Thus, a complete picture of how and why hybrids are forming is necessarily to understand the role of micro-action in constructing the macro field.

# Chapter 5: General Conclusion

## 5.1. Conclusion

The studies in this dissertation aimed to provide answers for the main question '*How do the different institutional logics impact the participation behavior of academics in the complex environment of UBC*? Using the Indonesian cases of UBC as the empirical study, the studies in this dissertation were examined to determine the role and behavior of academics who are involved in both government and self-initiated UBC and to investigate the coping strategies towards institutional complexity. Sub question 1 is discussed in chapter two and provides the recent context of academics' participation in UBC in the framework of the innovation ecosystem. This chapter sets the groundwork of the entire dissertation in which the problem of competing/conflicting institutional logics in UBC becomes apparent. The central question in this chapter is: *What is the impact of different institutional logics on the participation rate of academics in UBC designed in the innovation ecosystem*? We analyzed documents issued by government agencies, universities, and scientific articles, including strategies, policies, and assessments of the structured UBC programs. To understand how academics participate in these programs, we traced three waves of Technology and Science (TS) Programs designed for UBC and evaluated them. We evaluated the TS Programs and used them as the case studies. We analyzed the partnerships of actors in the innovation ecosystem, based on the Triple Helix, where university, government, and business have their place (Callon, 1998; Etzkowitz and Leydesdorff, 2000; Mars et al., 2012). UBC was projected as the foothold in the creation of an innovation ecosystem because it may leverage the flow of knowledge and technology from university to business. Universities are an institution that produces abundant knowledge and technology that has not been fully exploited. Bringing universities into the arena of innovation may improve a country's economic advantage and

competitiveness. By mimicking policies from advanced countries or from Innovation-Driven countries listed by the World Economic Forum, such as Singapore and South Korea, the government of Indonesia expects more academics and universities to become involved in UBC.

This chapter found that despite the improvements in the programs and policies, the number of universities and academics that engaged in the programs remained low. The document analysis revealed that academics and universities were facing major obstacles in developing and preserving the UBC, which originated from the institutional gap between universities and the business world. This situation explains that academics and business professionals 'live' in a different world and have different objectives. Academics consider the difference in institutional logic as the barrier to participate in UBC. Academics and business professionals are skeptical of one another. Academics suspect business professionals are only interested in profits, whilst business professionals assume academics are focused too much on their science 'logic', resulting in academics not meeting the commercial objectives. Three groups of problems emerge with different institutional logics, including differences in 'language' and communication, differences in the nature of work and culture, and bureaucracy. We conclude that academics who are not able or do not intend to participate in UBC are the ones who acknowledge that the academic and the business world are separated by two different logics. This is a major hurdle that needs to be overcome. In contrast, academics that are able to successfully participate in UBC are considered as the ones who can successfully merge the two different logics.

Sub question number 2 is discussed in chapter 3. The central question of the chapter is: *What are the incentives and obstacles of UBC perceived by university managers and academics?* We conducted interviews with individual academics and university managers at two different types of universities, public and private universities. Interview protocols were constructed from recent literatures on the drivers and barriers of UBC, including resources and facilities, personal relationship and institutional issues, and research and teaching issues. Results show that academics and university managers at both universities share a com-

mon perception on resources and facilities (infrastructures). In particular, they perceive that funding sources are the main incentives for UBC. They fully agree that resources and facilities are the forerunner for creating cooperation. Nevertheless, university managers at both universities have a different view about the source of funding. The public university receives regular funding from the government, whilst the private university is fully dependent on student fees and contributions from stakeholders. In personal relations and institutional issues, our study shows that university managers and academics strongly suggest that science and business are totally different. This is in agreement with research by Cyert and Goodman (1997), Lind et al. (2013), and Sauermann and Stephan (2013). Academics, however, could build relationships with business professionals through driving factors, like trust, which occurs when both academics and business professionals can overcome the issues of an institutional gap. Results suggest that teaching, research, and UBC is interwoven with each other. On one hand, UBC may influence the quality of teaching (Wang et al., 2013), and on the other hand, teaching can be considered to be an obstacle because academics require a lot of time to teach and teaching has become a priority (Arvanitis et al, 2008). The interplay between UBC and research is also problematic. Even though university managers and academics share common perceptions about research, academics perceive that applying research would be difficult. Applied and basic researches have opposite objectives that cannot be merged into one.

Based on the results, we conclude that both organizational actors share a common perception on the incentives of UBC, including industrial funding, organizational and individual reputation, trust from industries, and applied research. Further, organizational actors at both universities considered bureaucracy, industrial commitment, different in vision and orientation, teaching obligation and basic research to be the major obstacles for UBC. By this, we underline in the effort to successfully create UBC, university managers should consider reducing bureaucracy and gaining better trust from industries. As teaching and basic research become the obstacles, universities should consider reducing the work-load of academics in teaching – in Indonesian universities,

the teaching workload is 50% of the whole academic career. The way to reduce the gap between basic and applied research is to increase the number of 'academic credit' – In other words, academics that consider doing applied research should contribute a small amount of academic career credit. Other prominent obstacles are the difference in vision and orientation, which originally rooted from different institutional logics. Resolving the differences in institutional logics remains problematic and it depends on the personal capability to reduce the gaps. Hence, university managers should 'recognize' the 'skills' of the academics to deal with businesses before they become involved with. This means that academics should be able to cope with the different vision and orientation of the business world.

In chapter 4, we explore what the roles of the academics are and how they respond to competing institutional logics of science and business. The main questions in the final empirical chapter are: *How do academics cope with competing institutional logic when participating in UBC? What are the academics' roles and responses under the complexity of UBC?* In this chapter, we explore how individual academics cope and respond to science and business logic. To explore this, we conducted interviews with academics from two fields of science, electrical engineering and computer science. An interpretative analysis of the interview shows that experienced and inexperienced academics cope differently with competing logics. We found that, first; the science fields determine the degree of adherence to business logic, even though academics are aware about the boundary between science and business logics. Second, the level of knowledge of business positively determines the level of academics' adherence to business logic. However, being 'familiar' or 'identified' with business logic does not necessarily drive academics to participate in UBC. In contrast, being a novice in business does not necessarily inhibits academics from participating in UBC. Third, the commitment of a university to UBC influences the level of their adherence to the business logic of academics. Finally, the level of knowledge of the world of business (the degree of adherence to business logic) determines the role of academics in university-business cooperation.

We conclude that academics who are reluctant to participate in UBC may act as 'traditional academics' that ignore or defy business logic and stick to their dominant (science) logic. Meanwhile, academics who are interested in participating may act as a 'hybridizer', showing they can compartmentalize the two logics. The study in this chapter contributes to advance the knowledge about how individuals cope with institutional complexities, particularly in UBC. While scholars argue that hybrid individuals in UBC have the ability to shift, combine and 'blend' the logic of science and business (Tuunainen, 2005; Lam, 2010, 2011; Jain et al., 2009; Murray, 2010), we conclude that academics can be a hybrid when they are able to 'compartmentalize' the science and business logics, as they do not necessarily combine the values and practices of both logics. The coercive institutional demands, such as structured programs of UBC in Indonesia, have forced academics to become hybrids via participation, although may not be practically qualified for such a role.

### 5.2. Scientific contribution

This dissertation aims to contribute to UBC literature in three ways. First, the conducted research approaches the dynamic of Triple Helix partnerships from the perspective of institutional theory. Abundant studies have overlooked studying these partnerships from the top-down perspective or from the policy levels without considering the micro-actors involved in the Triple Helix constellation. The micro actors (including individual and universities) are crucial as shown in this study of UBC and in the innovation system because universities and academics are the important 'agents' for technology and knowledge transfer. Thus, the studies in the dissertation aimed to contribute to the advancement of knowledge regarding the need to resolve conflicts in the micro level by leveraging the academics' understanding toward the world of business. Another important contribution is that the connection between university managers and academics regarding the perceptions that drive and inhibit UBC is discussed in this dissertation. An entrepreneurial university expects its organizational actors to recognize

the need to 'commercialize' its research, therefore, a common perception for drivers and barriers will enhance the performance as an 'entrepreneurial' university. Second, the dissertation contributes to operationalize the terms of 'science logic' and 'business logic'. The operationalization is important as many approaches have recognized the science logic as the universal norm, value and belief of academics.

Our understanding about the connection between scientific disciplines and UBC is limited to how academics are able to cope with the business world and its 'entrepreneurial' attitude. However, the scientific discipline has an edge. In several disciplines, our empirical results suggested that academics can be flexible to cooperate with businesses, while others are not. We support the proposition of dependencies and uncertainty by Whitley, where the more dependent that academics are with their peers, the less leeway will be given by the field, resulting in more uncertainty in the fields and an openness for business cooperation. Third, the dissertation advances the knowledge on how individuals cope with institutional complexities, particularly in dealing with two competing institutional logics within an organization.

We provide empirical evidence on the coping mechanism of academics in UBC, as there was call for this by Pache and Santos (2013). The coping mechanism describes the pattern of academics' activity and behavior when they are either novice, familiar, and identified with business logic. While scholars have identified that academics that can 'bridge' the contradictive logics of business and science are the ones who can combine the values and norms (Tuunainen, 2005; Lam, 2010, 2011; Jain et al., 2009; Murray, 2010). However, we argue that even though they are familiar or identified with business logic, the two worlds remain separated. Therefore, we contribute to the term of hybrid in UBC, where hybrids are the ones who consciously or subconsciously "bridge" the two worlds, but compartmentalize them. However, because the studies in this dissertation were conducted in Indonesia, where UBC is one of an obligatory task for academics, the hybrid academics occur in two forms. First, a hybrid can be formed from experienced academics as they are involved based on individual interests or government funding. Second, a 'hybrid' can be formed from inexpe-

rienced academics and from disciplines that have distance to the world of business; it is an obligatory for them to be involved in UBC. Hence, Pache and Santos' (2013) proposition might not be applicable in this case.

### 5.3. Policy recommendation and implication

This dissertation proposed to respond to the government's focal point of the economic policy: To incorporate and to make its universities the center of the innovation ecosystem by stimulating the co-operation between universities and the business world. Our empirical study suggested that the main foothold for creating UBC is how academics deal and cope with the business world. Indeed, UBC depends on the availability of incentives, which is important; however, the personal relation and the institutional issues remain the major obstacles. The difference in logics is responsible because it disassociates the academic and the business world. The Indonesian government, through DGHE, has deployed waves of UBC programs throughout periods to stimulate knowledge and technology transfer in universities, but it seems like the government has slightly 'forgotten' why very few academics or professors participated in the programs. Departing from this situation, we aim to provide recommendations for policy makers in Indonesia and other countries in the effort to be an innovation-driven economy, as follows: First, in UBC programs, which were designed by the government agencies, are diverse and are designed for different types of business (industries). However, the programs were fully designed from the perspective of universities, without little regard to the needs of the business world. Attention to construct UBC programs that are more business-oriented is necessary. This is also important to reduce the tension and different objectives between universities and business. Furthermore, the government, through DGHE, should consider increasing the portion of Community Service programs to more than only 10 % of the total academic's career credits.

Increasing the participation of academics means that the academics can merge the different logics, or at least understand what the world

of business needs. Policy makers may 'help' academics and professionals to have a good relationship with business via business-oriented programs. Second, different types of higher education institutions may have different ways to deal with the business world. Our study suggests that participation in UBC is highly correlated to the level of experience with businesses. This suggests that policy makers should facilitate training for expert to novice academics for UBC. Based on these results, we recommend that novice academics in Indonesian universities should 'learn' from prominent exemplars before or during collaboration with the world of business.

Academics in Indonesia, or in other countries, are still 'living' in their (dominant) science logic. Our empirical studies suggest that, although academics have built relationships with the business world according to their science logic, translating the science logic to business logic is a challenging task for academics. In this direction, policy makers should facilitate academics as they 'shift' between the logics. Business and technology incubators have become one of the solutions to speed up this process. Every university has considered developing business incubators in an effort to facilitate research for the business world. Fourth, policy makers should not necessarily generalize UBC programs for all academics' profiles. This means that academics can be categorized by their experiences with the business world. Our study suggests that the more academics have knowledge with the business world, the more they can establish UBC and resolve conflict. Academics can be divided by their roles and how they cope with the business world, and can be categorized as novice, protector, intermediary, or advocator. With this respect, not all programs may fit with the academic profiles. Differentiation in programs may result in more participation of academics.

### 5.4. Limitation and future study

The studies in this dissertation were aimed to explain the impact of institutional complexities on the participation of academics in UBC. Using

Indonesian academics as the sample, we presented the attitudes and coping mechanisms via various forms of (structured) UBC. The results suggest that academics that do not intend or are not interested in getting involved are more likely to defy the logic of business, whilst those who participated are likely perceive that UBC is important and act as an intermediary. We highlight that those academics that participated can compartmentalize the two logics. A limitation in our qualitative study is that we only explored academics in computer science and electrical engineering (included in Professional Adhocracy) that show a moderate dependency to peers and have wide audiences. Exploratory studies in other disciplines, including the fields of Fragmented Adhocracy and Conceptually Integrated (Whitley's Type of Science, Whitley, 2000), would be necessary to broaden the understanding of the coping attitudes of academics, from very little to high dependency on peers and audiences. Moreover, the term of hybrid academics is still an open topic for discussion in future studies, as scholars are still in debate about the definition. This suggests that further empirical evidence is needed to describe the variation of hybrid attitudes. While the institutional logics perspective is useful for investigating the coping mechanisms, future study might lead to other theories. When academics act as an 'agent' and they may have conflict with business professionals, the agency theory may shed some light on this as the theory looks at conflicts between people with different interests with the same asset (Eisenhardt, 1989).

Although a case from a sample on this dissertation can describe the coping mechanisms in general, more empirical samples and multimethods are needed. A quantitative study is needed to investigate the interrelation among drivers, barriers, science logic, business logic, and participation of academics in UBC. Future study should bring all features together, such as driving and inhibiting factors, and the degree that university staff members perceive the way university and business logic restrict or allow for UBC influence participation. Future research should also examine structural impact. An approach, such as a survey among academics in the Indonesia universities or other contexts, may exhibit several relationships, including the following: the relationship

between the driving and inhibiting factors and participation, the leeway given by the academics' field (science logic) and participation, the conflict between business logic and academic duties and its impact to the participation of academics in UBC, the type of fields that influence the perception of leeway given by a field, and the influence of experience with business to perception towards science and business logics. Further, future study would gain the understanding toward how individuals act as a hybrid within complex institutions (Pache and Santos, 2013). As this dissertation suggests that a hybrid is an academic who can compartmentalize two diverging logics, more empirical evidence is needed to label individual academics with such a term. This suggests more empirical studies, particularly with different samples, may uncover different types of hybrid academics.

**Samenvatting (Summary in Ducth)**

Het hoofddoel van deze proefschrift is om te beantwoorden "hoe beïnvloeden de verschillende institutionele logica het gedrag van academici in de complexe omgeving van UBC (University-Business Cooperation)?" Samenwerking tussen universiteit (kennisinstellingen, in het algemeen) en de bedrijfsleven (industrie) is de brandstof geworden voor innovatie en economische groei. Niettemin blijft UBC complex en wordt beschouwd als een problematische taak voor de universiteiten en hun zakenpartners. Wanneer veel landen een beleid ontwikkelen om de wetenschap en de kennis die door de universiteit wordt geproduceerd, te "exploiteren", lijkt het erop dat veel pijn doet voor de overheid en de universiteit om de UBC te onderhouden of zelfs te "starten". De studie in dit proefschrift is gebaseerd op een diepgaand onderzoek en analyse van het UBC-programma, dat in Indonesië plaatsvindt. Aangezien het land dat in 2020 innovatiegedreven economie is, de academici (wetenschappers) toestaat en kennis overdraagt aan de industrieën, is het een van het innovatiebeleid. Echter, lage participatie en tal van ongemotiveerde academici die niet geïnteresseerd zijn in dit programma worden de obstakels. Daarom tracht deze proefschrift dergelijke verschijnselen te verduidelijken door te ondervragen (1) wat is de impact van verschillende institutionele logica voor innovatiesysteem? (2) Wat zijn de prikkels en obstakels van UBC waargenomen door universitaire managers en academici? (3a) Hoe behandelen academici mededingende institutionele logica in UBC? En (3b) Wat zijn de rollen en reacties van de academici van de UBC onder de complexiteit? Twee benaderingen werden ingezet, bureau- en case studies, die in vier empirische papieren waren verdeeld.

Hoewel de drijvende kracht van de UBC consistent is met industriële financiering; organisatorische en individuele reputatie; vertrouwen uit industrieën en toegepast onderzoek. Verder worden organisatorische actoren op beide universiteiten (privé en publiek) beschouwd als bureaucratie, industriële inzet, verschillend in visie en oriëntatie, onderwijs verplichtingen en basisonderzoek zijn de belangrijkste obstakels voor UBC. Het proefschrift laat zien dat het gedrag van academici

in de complexiteit van UBC in verschillende groepen van copingstrategieën kan worden ingedeeld op basis van hun rollen en reacties. Groep I (Traditionele Academici): academici die bekend zijn met wetenschapslogica maar beginnend in business logica. Deze groep academici negeert bedrijfslogica en voldoet aan wetenschapslogica. Personen in deze groep zullen als volgeling fungeren. Als de personen "geïdentificeerd" worden met wetenschappelijke logica, zullen ze fungeren als een "beschermer" die zakenlogica verdedigt. In Groep II (Traditionele Hybriden) kan een wetenschapper die geïdentificeerd is met wetenschappelijke logica en vertrouwd is met bedrijfslogica als integrator fungeren. De personen in deze groep compartimenteren de wetenschappelijke en zakelijke logica. In groep III (Entrepreneurische Hybriden) kunnen academici die (of voor de academische carrière) ervaring hebben met het bedrijfsleven als advocaat optreden. De personen in deze groep zijn "geïdentificeerd" met zakelijke logica en vertrouwd met wetenschap.

In het proefschrift wordt onderstreept dat de erkenning van de deelname van academici in de beginfase van de samenwerking moet worden opgenomen. Op basis van de bevindingen van dit onderzoek zouden de universiteiten en de overheid de "vaardigheden", "waarden" en "ervaringen" van individuele academici in het bedrijfsleven moeten "erkennen" alvorens ze in samenwerking met universiteitsondernemingen te betrekken. Uit dit onderzoek blijkt dat onervaren academici vooraf moeten leren over de logica van zaken voordat ze zich in samenwerking met bedrijfsprojecten betrekken. Uiteindelijk, om de UBC succesvol te maken, zouden individuele academici de verschillende visie en oriëntatie met de bedrijfswereld kunnen beheren.

**Intisari (Summary in Bahasa Indonesia)**

Tujuan utama pada penelitian ini adalah untuk menjawab "bagaimana logika institusi yang berbeda mempengaruhi perilaku keikutsertaan akademisi di lingkungan yang kompleks pada Kerjasama Universitas dan Bisnis (KUB)"? Kerjasama antara universitas (institusi pengetahuan, pada umumnya) dan dunia usaha (industri) telah menjadi pendorong bagi pertumbuhan inovasi dan ekonomi. Meski demikian, KUB tetap kompleks dan dianggap sebagai tugas yang rumit bagi universitas dan mitra bisnis mereka. Ketika banyak negara merancang kebijakan untuk "memanfaatkan" sains dan pengetahuan yang dihasilkan oleh universitas, tampaknya banyak rintangan bagi pemerintah dan universitas untuk mempertahankan atau bahkan untuk "memulai" KUB. Studi pada disertasi ini didasarkan pada penyelidikan mendalam dan analisis program KUB, yang dilakukan di Indonesia. Sebagai negara yang memiliki kebijakan untuk menjadi negara dengan Innovation-driven Economy pada tahun 2020, memberdayakan akademisi (ilmuwan) dan mentransfer pengetahuan ke industri adalah salah satu kebijakan inovasi. Namun, rendahnya partisipasi dan banyak akademisi yang tidak termotivasi untuk terlibat dalam program KUB menjadi hambatan utama. Oleh karena itu, disertasi ini mencoba menjelaskan fenomena tersebut dengan mempertanyakan (1) bagaimana dampak logika institusional yang berbeda untuk sistem inovasi? (2) Apa saja insentif dan hambatan KUB yang dirasakan oleh para manajer universitas dan akademisi? (3a) Bagaimana akademisi mengatasi logika institusional yang bersaing di KUB? Dan (3b) Apa peran dan tanggapan akademisi ketika berhadapan dengan kekompleksitasan KUB? Dua pendekatan dikerahkan, analisis data sekunder dan studi kasus, yang terbagi dalam empat makalah empiris.

Meskipun faktor pendorong dan penghambat ditemukan dan dianalisis pada penelitiani ini, temuan menunjukkan bahwa kedua pelaku organisasi seperti manajer universitas dan ilmuwan memiliki persepsi yang sama mengenai insentif KUB yang terdiri dari pendanaan industri; reputasi organisasi dan individu; kepercayaan dari industri dan penelitian terapan. Selanjutnya, pelaku organisasi di kedua universitas (swasta dan publik) menganggap birokrasi, komitmen industri, berbeda dalam visi dan orientasi, kewajiban untuk mengajar dan pene-

litian merupakan hambatan utama untuk KUB. Temuan menunjukkan bahwa perilaku partisipasi akademisi dalam kekompleksitasan KUB dapat dikelompokkan menjadi beberapa kelompok. Kelompok dibagi pada akademisi dengan strategi penanggulangan berdasarkan peran dan tanggapan mereka. Kelompok I (Akademisi Tradisional): akademisi yang mengenal logika sains tapi pemula dalam logika bisnis. Kelompok akademisi ini mengabaikan logika bisnis dan mematuhi logika sains. Akademisi dalam kelompok ini akan bertindak sebagai "pengikut". Jika akademisi "diidentifikasi" atau "ahli" dengan logika sains, mereka akan bertindak sebagai "pelindung", yang menentang logika bisnis. Di Grup II (Traditional Hibrida), akademisi yang teridentifikasi dengan logika sains dan familiar dengan logika bisnis dapat bertindak sebagai "integrator". Orang-orang dalam kelompok ini menempatkan ilmu pengetahuan dan logika bisnis menjadi dua hal yang terpisah, tetapi mampu menjalankan keduanya. Di Kelompok III (Entreprenerial Hibrida), akademisi yang memiliki (atau sebelum berkarir sebagai akademisi) pengalaman dengan bisnis dapat bertindak sebagai "advokator". Orang-orang dalam kelompok ini memahami logika bisnis dan terbiasa dengan sains.

Disertasi ini menggarisbawahi bahwa analisis kemampuan akademisi untuk menanggulangi perbedaan logika harus disertakan dalam fase awal KUB. Universitas atau pemerintah harus "mengenali" ketrampilan, "nilai" dan "pengalaman" akademisi dalam bisnis sebelum melibatkan mereka dalam KUB. Penelitian ini merekomendasikan bahwa para akademisi harus "belajar" terlebih dahulu tentang logika bisnis sebelum melibatkan diri mereka dalam kolaborasi dengan proyek industri. Akhirnya, untuk membuat KUB sukses, akademisi individual harus bisa mengelola visi dan orientasi yang berbeda dengan dunia bisnis.

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